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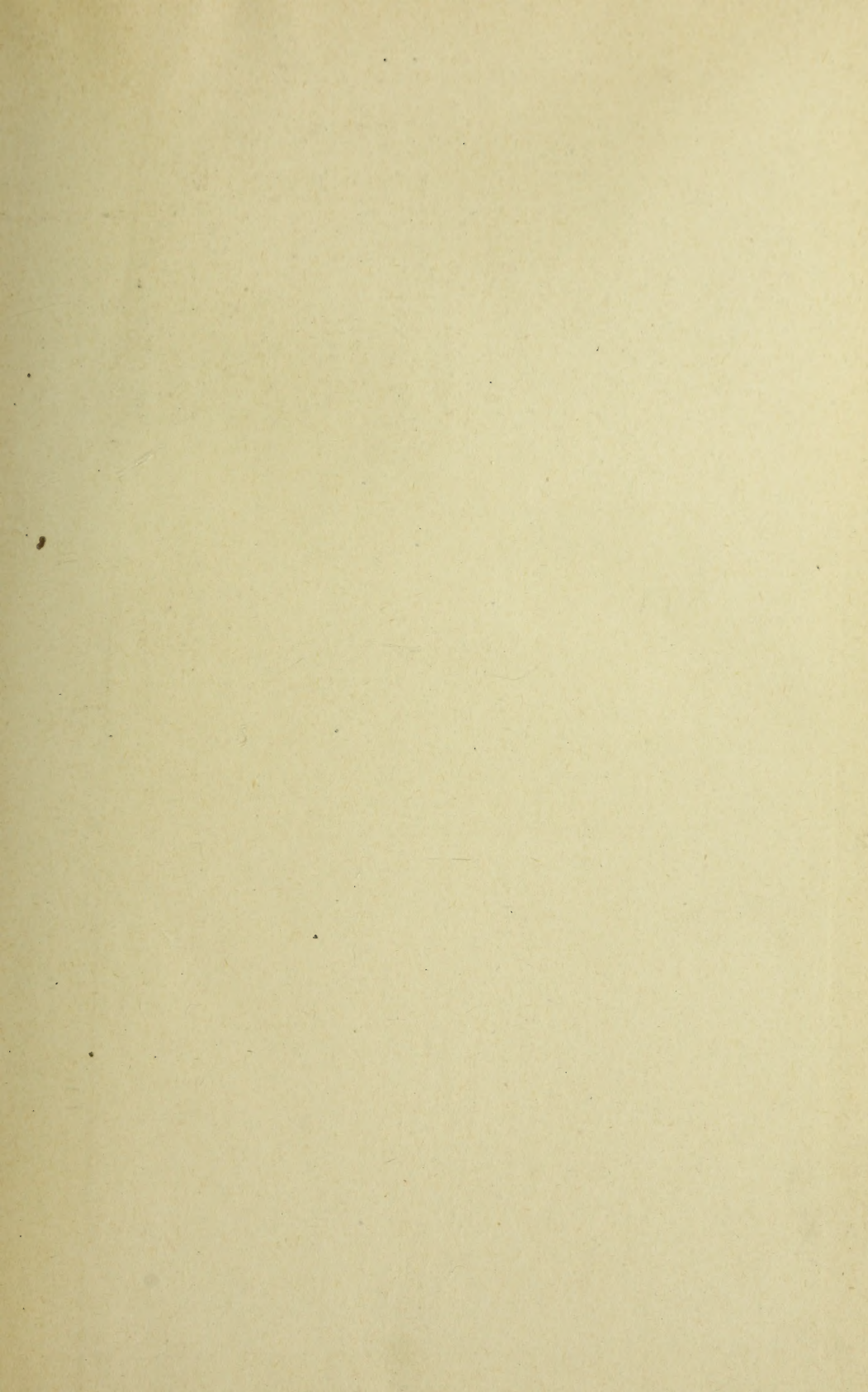
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FIFTY-FIRST ANNUAL REPORT

OF THE

Ohio State Board of Agriculture

WITH AN ABSTRACT OF THE
PROCEEDINGS OF

The County Agricultural Societies

FOR THE YEAR 1896,

TO THE

General Assembly of the State of Ohio.

NORWALK, O.

THE LANING PRINTING COMPANY

1897.

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ANNUAL REPORT
OF THE
Ohio State Board of Agriculture
FOR THE YEAR 1896.

In compliance with the law, the Fifty-First Annual Report of the State Board of Agriculture is herewith submitted to the General Assembly of Ohio. The report contains the transactions of the Board for 1896, entries and awards at the State Fair, proceedings of the State Agricultural Convention, statistics relating to the important farm crops of the state, proceedings of the State Farmers' Institute, selected papers presented at the County Farmers' Institutes, and such other matter as has been deemed proper and of interest to the farmers of the state.

The work of the Department of Agriculture is gradually but surely increasing, while its scope of usefulness is more fully recognized and generally appreciated than ever before, not only by farmers, but by all other classes, interested directly or indirectly in the progress and success of agriculture in Ohio.

The management of the State Fair, the publication of monthly crop reports, the inspection of commercial fertilizers, the conducting of farmers' institutes, the preparation, publication and distribution of agricultural documents, and the very large general correspondence, employs fully the time of the secretaries and employees in the Department.

The Department, with the aid and encouragement extended by the General Assembly of the State, is accomplishing very much in the direction of improved agricultural and economic methods, and the work is being appreciated and approved by the agriculturists of the state.

Respectfully submitted,

J. W. FLEMING,
Assistant Secretary.

W. W. MILLER,
Secretary.

Officers and Members
OF THE
Ohio State Board of Agriculture
FOR 1896-97.

OFFICERS AND MEMBERS OF THE BOARD.

OFFICERS AND MEMBERS FOR 1896.

J. C. BOWER, <i>President</i>	Columbus, Franklin Co.
J. T. ROBINSON, <i>Vice President</i>	Rockaway, Seneca Co.
A. J. CLARK, <i>Treasurer</i>	Cambridge, Guernsey Co.
G. LIGGETT	Watkins, Union Co.
A. H. KLING.....	Marion, Marion Co.
C. BORDWELL.....	Batavia, Clermont Co.
E. C. ELLIS.....	Crestvue, Hamilton Co.
L. G. ELY.....	Fayette, Fulton Co.
H. S. GRIMES.....	Portsmouth, Scioto Co.
ALBERT HALE.....	Mogadore, Summit Co.
W. W. MILLER, <i>Secretary</i>	Columbus, Franklin Co.
J. W. FLEMING, <i>Assistant Sec'y</i>	Columbus, Franklin Co.

EXECUTIVE COMMITTEE.

J. C. BOWER, *President*,
A. H. KLING,

H. S. GRIMES.

A. J. CLARK,
L. G. ELY,

FARMERS' INSTITUTE COMMITTEE.

J. T. ROBINSON, *Chairman*,

ALBERT HALE.

C. BORDWELL,

OFFICERS AND MEMBERS FOR 1897.

J. T. ROBINSON, <i>President</i>	Rockaway, Seneca Co.
C. BORDWELL, <i>Vice-President</i>	Batavia, Clermont Co.
J. C. BOWER, <i>Treasurer</i>	Columbus, Franklin Co.
A. J. CLARK	Cambridge, Guernsey Co.
G. LIGGETT	Watkins, Union Co.
E. C. ELLIS	Crestvue, Hamilton Co.
L. G. ELY	Fayette, Fulton Co.
H. S. GRIMES.....	Portsmouth, Scioto Co.
ALBERT HALE.....	Mogadore, Summit Co.
J. S. STUCKEY.....	Van Wert, Van Wert Co.
W. W. MILLER, <i>Secretary</i>	Columbus.
J. W. FLEMING, <i>Assistant Secretary</i>	Columbus.

EXECUTIVE COMMITTEE.

J. T. ROBINSON, <i>President</i> .	A. J. CLARK,
J. C. BOWER,	G. LIGGETT,
H. S. GRIMES.	

FARMERS' INSTITUTE COMMITTEE.

L. G. ELY, <i>Chairman</i> ,	ALBERT HALE,
C. BORDWELL.	

LIST OF MEMBERS
OF THE
Ohio State Board of Agriculture
FROM 1850 TO 1897.

LIST OF MEMBERS OF THE OHIO STATE BOARD OF AGRICULTURE,

FROM THE FIRST STATE FAIR TO THE YEAR 1897.

[Members are elected to serve two years. The Board consists of ten members; the term of service of five expires annually.]

Name.	Years of service inclusive.	Postoffice.
M. L. Sullivant†.....	1850-53	Columbus
S. Medary†.....	1850-53	Columbus
M. B. Bateham†.....	1850-51	Painesville
D. Lapham†.....	1850-51	Cincinnati
F. R. Elliott.....	1850-51	Cleveland
J. T. Pugsley.....	1850-51	Convenience
Arthur Watts†.....	1850-52	Chillicothe
J. M. Edwards.....	1850-52	Youngstown
C. Springer†.....	1850-52	Meadow Grove
J. G. Gest.....	1850-54	Xenia
S. Halloway.....	1850-51	St. Clairsville
Allen Trimble†.....	1850-51	Hillsboro
William Case†.....	1852-53	Cleveland
Philo Adams†.....	1852-53	Huron
R. W. Musgrave†.....	1852-57	Sulphur Springs
R. W. Steele.....	1853-56	Dayton
William H. Ladd.....	1853-56	Richmond
D. McIntosh.....	1853-54	Shalersville
J. T. Worthington†.....	1853-56	Chillicothe
Joseph Sullivant†.....	1854-55	Columbus
John K. Greene.....	1854-57	Cincinnati
James L. Cox.....	1854-55	Zanesville
B. Stedman†.....	1854-57	Cleveland
Alexander Waddle†.....	1855-60	South Charleston
Abel Krum.....	1855-58	Cherry Valley
Lucian Buttle†.....	1856-59	Columbus
G. W. Baker†.....	1856-57	Marietta
John M. Milliken†.....	1857-62	Hamilton
Luther Smith.....	1857-58	West Liberty
Thomas S. Webb.....	1857-58	Massillon
Norton S. Townshend† †.....	1858-63	Avon
L. Q. Rawson.....	1858-59	Fremont
James M. Trimble†.....	1858-61	Hillsboro
John Rebert†.....	1858-61	Lancaster
D. E. Gardner.....	1859-64	Toledo
William Dewitt.....	1859-64	Cleveland
C. W. Potwin.....	1859-62	Zanesville
T. C. Jones†.....	1860-67	Delaware
Henry B. Perkins.....	1860-63	Warren
David Taylor†.....	1861-66	Columbus
Jacob Egbert†.....	1862-63	Lebanon
Nelson J. Turney†.....	1862-69	Circleville
D. McMillan†.....	1863-70	Xenia
W. R. Putnam.....	1863-64	Marietta
William F. Greer†.....	1864-67	Painesville
James Fullington†.....	1864-69	Irwin Station

MEMBERS OF THE STATE BOARD OF AGRICULTURE—Continued.

Name	Years of service inclusive.	Postoffice.
William B. McClung	1864-71	Troy
James W. Ross	1865-70	Perrysburg
R. R. Donnelly†	1865-68	Wooster
James Buckingham	1865-72	Zanesville
J. Park Alexander	1867-70	Akron
Norton S. Townshend ††	1868-69	Avon
William Lang†	1868-71	Tiffin
D. C. Richmond	1869-74	Sandusky
R. P. Cannon	1870-75	Aurora
James B. Jamison	1860-77	Cadiz
L. G. Delano†	1870-75	Chillicothe
L. B. Sprague	1871-76	Springfield
Simpson Harmount	1871-76	New Philadelphia
John A. Warder†	1871-76	Cleves
W. S. Hickox	1872-73	Mansfield
B. W. Carlisle†	1872-79	Hooker's Station
Justus C. Stephens	1873-74	Kenton
John M. Pugh	1874-79	Columbus
L. B. Wing	1875-80	Newark
Russell C. Thompson†	1875-76	Sylvania
Leo. Weltz†	1876-83	Wilmington
D. L. Pope	1876-81	Welshfield
Charles Smith†	1877-80	Marion
E. T. Stickney†	1877-78	Republic
A. E. Stone	1877-78	Gallipolis
Peter Murphy	1877-80	Hughes' Station
W. N. Cowden	1878-83	Quaker City
R. Baker	1879-82	Elyria
Arvine C. Wales†	1879-82	Massillon
R. H. Haymen	1880-81	Portsmouth
O. P. Chaney	1880-82	Canal Winchester
C. D. Bailey	1881-88	Gallipolis
J. C. Levering	1881-86	Leverings
William S. Foster	1881-88	Urbana
L. B. Harris†	1882-87	Upper Sandusky
J. H. Brigham	1882-89	Delta
L. N. Bonham	1883-86	Oxford
H. Talcott†	1883-87	Jefferson
N. A. Sims	1883-85	Columbus
T. P. Shields	1884-87	Watkins
John Pow	1884-89	Salem
S. H. Hurst	1884-89	Chillicothe
J. J. Sullivan	1887-88	Millersburg
Joseph H. Terrel	1887-88	New Vienna
J. G. Russell	1887-90	Mt. Gilead
H. G. Tryon†	1888-91	Willoughby
J. M. Black	1888-90	Hanover
A. H. Kling	1889-96	Marion
H. S. Grimes	1889-90	Portsmouth
A. J. Clark	1889	Cambridge
W. W. Miller	1889-94	Castalia
J. W. Pollock	1890-93	Cedarville
N. Ohmer	1890-95	Dayton
L. G. Ely	1890-91	West Unity
E. L. Hinman	1890-93	Columbus
J. C. Bower†	1891	Athens
George Lewis	1891-94	Van Wert
Chester Bordwell	1892-93	Batavia

MEMBERS OF THE STATE BOARD OF AGRICULTURE—Concluded.

Name.	Years of service inclusive.	Postoffice.
F. A. Derthick.....	1892-95	Mantua
J. T. Robinson.....	1894	Rockaway
G. Liggett.....	1894	Watkins
J. H. Pringle.....	1894-95	Cardington
E. C. Ellis.....	1895	Crestvue
Chester Bordwell.....	1895	Batavia
L. G. Ely.....	1896	Fayette
H. S. Grimes	1896	Portsmouth
Albert Hale	1896	Mogadore
J. S. Stuckey.....	1897	Van Wert

†Deceased.

‡Removed to Columbus.

TABLE SHOWING THE PLACE AND RECEIPTS OF EACH STATE FAIR
HELD; ALSO A LIST OF THE OFFICERS FOR EACH YEAR OR FAIR.

Year	President.	Treasurer.	Secretary.	Place of fair.	Receipts
1850	M. L. Sullivant*.....	Samuel Medary*.....	M. B. Bateham*.....	Cincinnati.....	\$8,036 18
1851	same	same	W. W. Mather*.....	Columbus.....	8,204 00
1852	Arthur Watts*.....	same	same	Cleveland.....	13,350 00
1853	Samuel Medary*.....	M. L. Sullivant*.....	George Sprague.....	Dayton.....	13,996 37
1854	R. W. Musgrave*.....	Joseph Sullivant*.....	same	Newark.....	8,824 58
1855	J. T. Worthington*.....	same	same	Columbus.....	9,745 54
1856	William H. Ladd.....	Lucien Buttles*.....	same	Cleveland.....	16,684 20
1857	Alexander Waddle*.....	same	John H. Klippart*.....	Cincinnati.....	17,530 75
1858	John M. Millikin*.....	same	same	Sandusky.....	9,997 70
1859	N. S. Townshend*.....	same	same	Zanesville.....	9,958 83
1860	Alexander Waddle*.....	Charles T. Potwin.....	same	Dayton.....	11,998 50
1861	Darwin E. Gardner*.....	same	same .....	.....	8,036 18
1862	Thomas C. Jones*.....	David Taylor*.....	same	Cleveland.....	11,260 64
1863	N. S. Townshend*.....	same	same .....	.....	11,142 09
1864	Neelson J. Turney*.....	same	same	Columbus.....	12,620 54
1865	same	same	same .....	.....	10,658 05
1866	William B. McClung.....	same	same	Dayton.....	14,035 80
1867	Daniel McMillan*.....	James Buckingham.....	same .....	.....	18,692 98
1868	James Fullington*.....	same	same	Toledo.....	15,606 25
1869	same	same	same .....	.....	19,606 50
1870	James W. Ross.....	J. Park Alexander.....	same	Springfield.....	18,252 25
1871	William Lang.....	James Buckingham.....	same .....	.....	16,460 25
1872	James Buckingham.....	Simpson Harmount.....	same	Mansfield.....	19,149 45
1873	Lincoln G. Delano*.....	same	same .....	.....	22,517 50
1874	same	same	same	Columbus.....	27,674 79
1875	R. P. Cannon.....	same	same .....	.....	20,539 30
1876	S. Harmount.....	J. M. Pugh.....	same .....	.....	11,909 61
1877	J. B. Jamison.....	same	same .....	.....	21,151 21
1878	J. M. Pugh.....	L. B. Wing.....	same .....	.....	11,979 50
1879	B. W. Carlisle*.....	same	J. W. Fleming.....	.....	30,703 35
1880	L. B. Wing.....	D. L. Pope.....	W. I. Chamberlain.....	.....	23,682 20
1881	D. L. Pope.....	Leo Weltz*.....	same .....	.....	29,706 16
1882	R. Baker.....	W. N. Cowden.....	same .....	.....	34,082 52
1883	W. N. Cowden.....	L. B. Harris*.....	same .....	.....	38,513 78
1884	W. S. Foster.....	same	same .....	.....	33,306 48
1885	C. D. Bailey.....	J. C. Levering.....	same .....	.....	29,796 51
1886	L. N. Bonham.....	L. B. Harris*.....	same†.....	.....	30,533 17
1887	J. H. Brigham.....	same	L. N. Bonham.....	.....	30,902 10
1888	John Pow.....	J. G. Russell.....	same	Centennial year, no fair	.....
1889	same	same	same	Columbus.....	19,637 41
1890	J. G. Russell.....	A. H. Kling.....	same .....	.....	27,574 55
1891	J. M. Black.....	same	same .....	.....	33,878 64
1892	A. H. Kling.....	W. W. Miller.....	same .....	.....	30,357 19
1893	J. W. Pollock.....	same	same .....	.....	19,350 93
1894	W. W. Miller.....	F. A. Dertnick.....	same .....	.....	27,260 25
1895	A. J. Clark.....	same	W. W. Miller.....	.....	33,966 13
1896	J. C. Bower.....	A. J. Clark.....	same .....	.....	22,531 20
1897	J. T. Robinson.....	J. C. Bower.....	same .....	.....	.....

*Deceased. †Served six months to July 1, when he resigned and was succeeded by L. N. Bonham.

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TRANSACTIONS
OF THE
Ohio State Board of Agriculture.
FOR THE YEAR 1896.

DEPARTMENT OF AGRICULTURE,
COLUMBUS, Thursday, January 16, 1896,
9:30 O'CLOCK P. M.

The following gentlemen, members and members elect of the Ohio State Board of Agriculture, met for organization :

NEWLY ELECTED MEMBERS :

J. T. Robinson, Rockaway, Seneca county, O.
G. Liggett, Watkins, Union county, O.
L. G. Ely, Fayette, Fulton county, O.
Albert Hale, Mogadore, Summit county, O.
(Not present) H. S. Grimes, Portsmouth, Scioto county, O.

HOLD OVER MEMBERS :

A. H. Kling, Marion, Marion county, O.
A. J. Clark, Cambridge, Guernsey county, O.
J. C. Bower, Columbus, Franklin county, O.
C. Bordwell, Batavia, Clermont county, O.
E. C. Ellis, Crestvue, Hamilton county, O.

The oath of office was administered by J. W. Fleming, notary public, to all except Mr. H. S. Grimes, who was not present.

On motion, Mr. E. C. Ellis was named as temporary chairman, who, on assuming the chair, announced as the first business in order the election of a President.

Mr. A. J. Clark nominated for President Mr. J. C. Bower, of Franklin county, and he was duly elected by ballot. Balloting for other officers of the Board was then proceeded with, resulting as follows :

Vice-President, J. T. Robinson.

Treasurer, A. J. Clark.

Secretary, W. W. Miller.

Assistant Secretary, J. W. Fleming.

Director of Weather and Crop Service, W. W. Miller.

Assistant Director of Weather and Crop Service, W. H. Richardson.

On accepting the office of Secretary, Mr. Miller reviewed the work of the Department during the past year, suggesting improvements in certain lines that would insure the greatest efficiency and method and still preserve economy.

Mr. Kling offered the following, which was adopted :

Resolved, That the publication of weekly crop bulletins, under the weather and crop service division of the Department, be discontinued.

On motion of Mr. Kling, the appointment of superintendent of the fair grounds and the necessary office force was referred to the Secretary.

On motion of Mr. Ellis, the Secretaries were authorized to refurnish the office as may be necessary to the work, the preservation of the records and the convenience of the Board.

The following was submitted, and, after fitting eulogies by members of the Board, unanimously adopted :

" Since the last annual meeting of the Board, the summons of death has come to the most distinguished man ever conspicuously connected with the agriculture of Ohio. Doctor Norton S. Townshend, who died July 13, 1895, was elected a member of the State Board of Agriculture in 1858. He served eight years in this capacity, and was twice elected president of the Board. During this period he was prominent in the counsels of the Board, and his advice was constantly sought and acted upon by it. In the many years, both before and after his connection with the Board, he was always personally helpful in advancing its interests, and in his various official capacities, as representative in the General Assembly of Ohio, as a member of the Ohio Senate, as member of the National Congress, and as Professor of Agriculture of the Ohio State University, he lent his influence in helping its work. His breadth of vision, his large heartedness, and his devotion to the cause of agriculture won for him the respect and love of all who came in contact with him, and the Board of Agriculture hereby expresses its personal sense of loss and the loss to the cause of agriculture of the noblest of nature's noblemen."

On motion, the Board adjourned to meet at 8 30 A. M., January 17th.

8:30 A. M., January 17.

The Board convened as per adjournment, President Bower in the chair.

The President announced the following assignment of departments for the State fair of 1896 :

First department—Horses.....	C. Bordwell.
Second department—Cattle.....	L. G. Ely.
Third department—Sheep.....	G. Liggett.
Fourth department—Swine.....	E. C. Ellis.
Fifth department—Poultry.....	E. C. Ellis

Sixth department—Farm Products.....	Albert Hale.
Seventh department—Fruits and Flowers.....	Albert Hale.
Eighth department—Machinery and Implements.....	J. T. Robinson.
Ninth department—Mechanics' and Manufacturers' Products.....	A. H. Kling.
Tenth department—Woman's Work.....	H. S. Grimes.
Eleventh department—Merchandise.....	A. H. Kling.
Twelfth department—Fine Arts	H. S. Grimes.

The members in charge of the several departments were empowered to appoint the necessary superintendents, and report to the Secretary.

The President made the following appointment of committees :

EXECUTIVE COMMITTEE—A. J. Clark, A. H. Kling, L. G. Ely, H. S. Grimes.

The President, agreeable to the rules of the Board, being a member of this committee and the chairman thereof.

FARMERS' INSTITUTE COMMITTEE—J. T. Robinson, chairman, C. Bordwell and Albert Hale.

FINANCE COMMITTEE—A. H. Kling, chairman, G. Liggett and E. C. Ellis.

On motion, the Board adjourned to meet at the call of the President.

DEPARTMENT OF AGRICULTURE,

COLUMBUS, May 26, 1896,

10 O'CLOCK A. M.

The Board met, pursuant to the call of President Bower, who occupied the chair. On roll call, all members were found to be present.

The minutes of the preceding meeting were read and approved.

On motion, the Board proceeded to the appointment of expert awarding judges for the forthcoming State fair, resulting as follows :

HORSE DEPARTMENT.

Chas. H. Ganson.....	Urbana, O., Starter
Chas. Woodward.....	Perrintown, O., Speed and Classes.
T. A. Johnson.....	Antrim, O., Speed and Classes.
V. D. Craig.....	Washington, O., Speed.
W. H. Miller.....	Van Wert, O., Draft Sweepstakes.
Chas. H. Ganson.....	Urbana, O., Roadster Sweepstakes.
Albert Pickering.....	Columbus, O., Patrol Judge.
S. C. Dickerson.....	Cadiz, O., Grade Draft.

CATTLE DEPARTMENT.

Prof. Thomas F. Hunt	Columbus, O., Dairy Breeds.
N. W. Baker.....	Athens, O., Beef Breeds.
G. M. Roudebush, Newtonville, O., with two other judges to be selected by the member in charge, to pass upon Grand Sweepstakes for Beef Breeds.	

SHEEP DEPARTMENT.

Frank Moore.....	Greensprings, O., Fine Wool Sweepstakes.
Uriah Cook.....	North Mansfield, O., Fine Wool Classes.

AGRICULTURAL REPORT.

S. H. Todd.....	Wakeman, O., Long Wools.
W. N. Cowden.....	Quaker City, O., Downs.
Jas. P. Carter.....	Marysville, O., Long Wools and Downs Sweepstakes.

SWINE DEPARTMENT.

John L. Van Doren.....	Crestvue, O., Poland Chinas and Duroc Jerseys.
John M. Jamison.....	Roxabell, O., Berkshires.
W. H. Pool.....	Delaware, O., Chester Whites.

POULTRY.

J. M. Marshall.....	Middletown, O.
W. C. Hankinson	Blue Ball, O.
Ira C. Kellar.....	Prospect, O.

FARM PRODUCTS, FRUITS AND FLOWERS.

O. S. Brown,.....	Londonderry, O., Maple Products, Bees and Honey.
W. B. Main.....	Delaware, O., Potatoes and Vegetables.
Other judges referred to the member in charge, to report later.	
S. R. Moore.....	Zanesville, O., Apples.
Frank Ford.....	Ravenna, O., Grapes.
J. P. Dysert.....	Rockford, O., Grain and Seeds.
H. A. Hart.....	Cleveland, O., Plants and Cut Flowers.

WOMAN'S DEPARTMENT.

Miss A. L. Sanford.....	Portsmouth, O., China Painting.
Miss Clara Waller.....	Portsmouth, O., Art Needle Work.
Mrs. Theo. Doty.....	Portsmouth, O.
Mrs. Lou Marshall.....	Sidney, O.
Miss Sadie Oldham.....	Cambridge O.

ENTRY CLERKS.

Miss Jennie Fleming.....	Columbus, O.
Miss Elsie Tynes.....	Portsmouth, O.

HELP.

Mrs. J. C. Bower.....	Columbus, O.
Mrs. H. S. Grimes.....	Portsmouth, O.
Miss Carrie M. Ellis.....	Crestvue, O.
Miss Hattie Taylor.....	Marion, O.
Miss Alice Robinson.....	Rockaway, O.
Mrs. Jessie Schaffer.....	Cambridge, O.

On motion of Mr. Grimes, the compensation of judges was ordered to be the same as last year, and that the compensation of help who are required to remain at night be fixed at \$4 per day.

The President announced an invitation to the Board, from the Columbus Central Electric Railway, to visit Minerva Park this evening, which invitation, on motion of Mr. Grimes, was accepted.

The Secretary reported the action of the General Assembly in providing for the payment of bonds and interest; in amending the farmers' institute law and the provision for refurnishing the office.

The Secretary reported that since the last meeting of the Board, he had felt called upon and deemed it to the best interests of the Board and the state to dissolve the cooperative feature of the weather and crop service existing between the United States and State Agricultural Department. Changes proposed by the U. S. Department made it inexpedient to continue the cooperative feature, besides the expense entailed on the part of the Board would not warrant a continuance. The arrangement to discontinue was perfectly agreeable to both Departments, and would give to the State Department the services of an additional clerk without additional cost. The United States Department sought the discontinuance.

On motion of Mr Kling, the action of the Secretary in discontinuing the cooperative work referred to, was approved.

On motion of Mr. Kling, it was ordered that the State Fair Grounds be used only for the legitimate purposes of the annual exhibitions, and that the Secretary be directed to decline requests for their use for any other purpose.

The purchase of straw and arrangements for feed for the ensuing Fair were referred to the Secretaries.

Under the farmers' institute law as amended, the rules of the Board for the organization of county societies and the conducting of institutes were revised, and on motion of Mr. Ely, the following were adopted and ordered to be printed.

RULES

OF THE OHIO STATE BOARD OF AGRICULTURE FOR THE ORGANIZATION
AND MANAGEMENT OF FARMERS' INSTITUTE SOCIETIES,
ADOPTED MAY 26, 1896.

SECTION 1. Parties who contemplate organizing Farmers' Institute Societies and Farmers' Institute Societies already organized desiring to hold meetings under the auspices of the State Board of Agriculture, in accordance with the act of the General Assembly of Ohio, passed April 26, 1890, and amended April 27, 1896, must first present a petition to the State Board of Agriculture for the same, signed by twenty or more residents of the county, without regard to sex, but all signers must be of legal age. In order that the Board may act intelligently on such petitions, the petitioners should furnish replies to questions propounded by the State Board of Agriculture concerning proposed place of meeting, capacity of hall or building to be occupied, railway facilities, etc. Blank petitions with the questions to be answered will be furnished on application, by the Secretary of the State Board of Agriculture, at Columbus.

SECTION 2. Said petitions should be filed with the Secretary of the State Board of Agriculture not later than the first day of September of any year. Earlier presentation will greatly facilitate the work of the

Board in considering applications and assigning dates and speakers. Petitioners will be promptly notified of such action as the State Board of Agriculture may take.

SECTION 3. After the petition for the holding of an institute meeting shall have been granted, the petitioners will proceed to organize, if not already organized, by the election of a president, vice-president, secretary, treasurer and an executive committee of three (the president and secretary to be ex-officio members of this committee, making a committee of five), all to serve for the period of one year or until their successors are duly elected. After the first organization an election of officers shall be held during each annual institute meeting, only members of the society being entitled to vote. Of the officers, not more than two shall be elected who are residents of the same township. The society shall adopt a constitution and by laws in harmony with the institute law of the state and these rules.

SECTION 4. As soon as an organization is completed it shall be reported to the Secretary of the State Board of Agriculture, with the name of the society, and the names and post office addresses of the officers and a copy of the constitution and by laws.

SECTION 5. The secretary of each institute society shall keep in a substantial book or books a record of all meetings of the executive committee and society, and a roll of the members, with the post office address of each; first, the original petitioners for the organization, followed by residents of the county or locality, of legal age, who, by enrolling their names in the secretary's book, become members of the society.

SECTION 6. When a petition has been granted, and the society notified of the date assigned for its institute meeting and the lecturers to be furnished by the State Board of Agriculture, the executive committee shall proceed in due time to make arrangements for the institute meeting, by engaging hall, selecting the local talent desired, arranging for music and all other details necessary for the successful holding of a farmers' institute meeting, and preparing a program which shall occupy the time assigned for the meeting. In arranging the program, time shall be allowed for discussion of the topics presented and for miscellaneous questions. The speakers sent by the State Board of Agriculture are to occupy not more than half the time of the institute meeting, and local talent, discussions and music the remaining time. The program should be published for general distribution at least two weeks in advance of the institute meeting, and at the same time a copy mailed to the Secretary of the State Board of Agriculture and to each speaker who is to take part. Societies should thoroughly advertise and use diligence and enterprise to create an interest among the people and to secure the largest possible attendance. Every citizen of the county and locality ought to be informed as to the time, place and nature of the institute meeting. The executive committee shall have full authority to audit and settle all accounts made or a nd in behalf of the institute society.

SECTION 7. All institute societies organized under the institute law of the state shall be strictly non-partisan and non-sectarian in every phase of their work, and no institute shall be conducted in the interest of any party, sect or society, but for the equal good of all citizens and farming communities.

SECTION 8. The presiding officers of the various institute societies of the state, holding meetings under the auspices of the State Board of Agriculture, should always and under all circumstances prohibit discussions of subjects other than those pertaining to agriculture, horticulture stock breeding, etc.; anything of a sectarian or partisan character should not be discussed or commented upon either by speakers or members of institute societies; no criticisms of state, county or township officials should be tolerated under any circumstances.

SECTION 9. No fee shall be charged for admission to institute meetings held under the auspices of the State Board of Agriculture; they shall be public and free to all, the object being to impart agricultural knowledge and experience free to all persons sufficiently interested to attend. If any society desires to hold quarterly, monthly or weekly meetings during the year, the expense of the same may be met by admission fees, subscriptions, collections or sale of season tickets. Nothing in this section shall prevent voluntary contributions or subscriptions for securing speakers desired other than those sent by the State Board of Agriculture.

SECTION 10. Within ten days after the close of each institute meeting, the secretary shall make a report to the Secretary of the State Board of Agriculture, blanks for which will be furnished. On receipt of such report by the Secretary of the State Board of Agriculture he will issue the certificate, according to law, which will enable the society to draw the amount due from the county.

SECTION 11. A society or its executive committee may, on the call of the president, hold such business meetings as may be necessary to transact the business of the society and arrange for the annual institute meeting to be held under the auspices of the State Board of Agriculture; and the traveling expenses of the executive committee for such meetings may be paid as other items and charged with other expenses of the institute.

SECTION 12. When the secretary of a farmers' institute society shall send a written report to the Secretary of the State Board of Agriculture, as provided by Section 10 of these rules, he shall state the cost of the institute meeting (not including expense of speakers sent by the State Board of Agriculture), number in attendance during the institute meeting, speakers who filled appointments, speakers absent, whether speakers were acceptable or otherwise, and report any feature or matter of special interest.

SECTION 13. The State Board of Agriculture requires that lecturers employed by the Board shall devote their time and efforts to the discussion of such subjects as are clearly provided for by the institute law of the

state, namely, "Farming, stock raising, fruit culture and all branches of business connected with the industry of agriculture."

The Secretary explained the condition of the Grant cottage located on the fair grounds, and called attention to the necessity of protecting the same. Consideration was deferred until the Board should visit the grounds.

On motion, a recess was taken to visit the fair grounds to examine the improvements in progress, as reported by the Secretary, and ascertain what further improvements are necessary to protect the fair ground property and fully equip the buildings for the ensuing fair.

On return from the grounds, the Board reassembled in the department of agriculture and proceeded to the transaction of business.

On motion, the action of the Secretary in directing improvements to the grand stand was approved.

On motion of Mr. Clark, the repairs necessary to be made to the north and south annexes and to the cattle amphitheater, were referred to the President and Secretaries, with power to act.

On motion of Mr. Clark, Capt. Alexis Keeler was appointed as Chief of State Fair police.

On motion of Mr. Bordwell, it was agreed that the compensation to the chief of police be the same as last year.

The Assistant Secretary reported the progress of advertising and the arrangements for special attractions.

On motion of Mr. Clark, the President and Secretaries were constituted a committee, with power to act, to consider the removal of the Grant cottage to a more conspicuous place on the grounds, and the erection of a suitable building to protect it.

The matter of boiler inspection was referred to the Secretary.

On motion, the Board adjourned to meet at the call of the President.

DEPARTMENT OF AGRICULTURE,

COLUMBUS, August 28, 1896,

8 O'CLOCK, P. M.

The Board met pursuant to call. Members all present. The minutes of the preceding meeting were read and approved.

The Secretary reported that agreeable to the order of the Board at last meeting, relative to certain improvements, a memorial building had been erected over the Grant cottage, the manner of constructing the building being by contract. Plans were made and bids invited, and the contract finally let for \$3,500, being \$500 less than the lowest bid presented. The Secretary made further report, that the grand stand had been improved and strengthened and made perfectly safe, by renewing

the sills and otherwise repairing, so that now the building is as good or better than when first erected.

In the north and south annexes, iron columns have been constructed and placed in position to secure and support the roof and upper work of these buildings.

The cattle amphitheater has also been improved and strengthened, and made substantial and safe. The judges' and band stands were given proper attention in the general repairs. All improvements and repairs have been made at most reasonable cost and the work in every respect has been well done.

On motion of Mr. Clark, the action of the committee in the matter of improvements and the expenditure of money for the same was approved.

The Secretaries extended an invitation to the Board, for a ride in the electric car "Electra," on Saturday evening, August 29, which invitation was accepted.

The Secretary stated that requests were being made for a reduction in price of State Fair tickets, to firms purchasing quantities for presentation to their employees.

On motion of Mr. Hale, the matter was referred to the Secretaries.

On motion of Mr. Ellis, it was agreed that all propositions for running wires into the grounds, for independent electric light, be declined.

The Secretary reported the inspection of boilers and the placing of insurance on same in the sum of \$15,000.

A proposal from A. F. Turpin for a concession to operate an entertainment of illusion on the fair grounds, five dollars being inclosed for telegraphic communication, was rejected, and the five dollars ordered returned to him.

The Assistant Secretary submitted samples of tickets for use during the Fair and explained their value and purpose.

The President and Secretary were instructed and authorized to make the necessary additional repairs to buildings after the fair.

The Secretary read a communication from the Harmon Roofing Co. requesting an allowance of interest on account of roof repairs. The Secretary read copy of his reply, declining to respond, holding that nothing was due under the contract.

On motion of Mr. Ellis, the action of the Secretary was approved.

The President and Treasurer were instructed to make special hotel arrangements for members during fair week.

On motion, the Board adjourned to meet at the call of the President.

ADMINISTRATION BUILDING, PRESIDENT'S OFFICE,
COLUMBUS, O., September 4, 1896.
STATE FAIR GROUNDS,
4:30 O'CLOCK P. M.

The Board met on call of the President, there being present Messrs. Bower, Robinson, Kling, Hale, Ellis and Bordwell.

Mr. Kling moved that the President and Secretary be authorized and directed to execute a note for and in behalf of the Board in the sum of eleven thousand dollars (\$11,000) for the purpose of securing money to pay premiums awarded at this annual State Fair, August 31 and September 1, 2, 3, 4, 1896; this being made necessary because of the small receipts from visitors on account of the severe and long continued storm prevailing on Thursday, September 3d inst.

A ye and nay vote was taken resulting as follows:

Yeas: Messrs. Robinson, Kling, Hale, Ellis, Bordwell and President Bower.

Nays: None, whereupon the motion was declared unanimously carried.

At 5 o'clock P. M. an adjournment was made to meet at the call of the President.

DEPARTMENT OF AGRICULTURE,
COLUMBUS, Sept. 25, 1896,
7 O'CLOCK P. M.

The Board met pursuant to the call of the President, there being present on roll call, Messrs. Robinson, Liggett, Grimes, Ellis, Clark, Bordwell, Kling, Hale and President Bower, who occupied the chair. Absent, Mr. Ely.

The minutes of the preceding meeting were read and approved.

The Assistant Secretary presented a financial statement covering a period from December 1, 1895, to September 14, 1896, which statement was approved.

The protests filed against awards at the last fair were presented and disposed of as follows:

1. Protest by Otto Curl against award to S. H. Turner on pair of matched coach horses, claim being made that same team had shown in another class and hence should be disqualified.

On motion, the protest was referred to the President and Secretary.

2. Protest by Chas. W. Ford against second premium award on display of Irish potatoes to E. G. Stockman, claim being made that three of

the varieties were incorrectly labeled. The answer to protest disputed the claim as did also the statement of the member in charge.

On motion of Mr. Ellis, the protest was not sustained.

3. Protest by Mrs. W. F. Barr et al. against the awards to Miss Nellie Charles, in the amateur class of plants and flowers. Protestants claim that Miss Charles is a professional grower and that the exhibits upon which she was awarded premiums were grown in the same garden and green houses as those exhibited by her father in the professional list, which is in strict violation of the rules.

Miss Charles admitted residence with her father, but claimed to be independent of him in the growth of her flowers.

Mr. Kling moved that the protest be sustained, which motion was agreed to.

4. Protest by Reuben Gentry and James Riley against awards in certain named classes of Berkshire swine, and involving premiums to O. P. Wolcott, J. D. Skinner, Kellogg Stock Farm, Connell & Son and L. C. Peterson. The grounds set forth for protest were failure to make proper examinations, and incompetency of judge to judge according to the standard adopted by the American and National Berkshire Associations.

The parties affected filed answers, showing that judgment had been properly and impartially rendered and cited the fact that at the Indiana State Fair, where many of the same animals had come into competition, the judgment rendered at the Ohio State Fair had not been reversed, though passed by another expert.

Mr. Riley, one of the protestants, filed a statement withdrawing the protest so far as he was concerned.

Mr. Ellis, the member in charge, expressed his confidence in the ability of the judge who passed upon the classes and his belief in the correctness of the awards.

Mr. Liggett moved that the protest be not sustained and that the premiums be paid as awarded by the judge, which motion prevailed.

It was, on motion, agreed that a return of entrance fees be made to the following persons who made entries, and for good cause were prevented from showing or being present at the fair with their animals:

Goodwin & Judy, West Lebanon, Ind.....	\$16 00
F. C. Lampe, Jeffersonville, O.....	4 50
R. L. Spencer, Salesville, O.....	7 50

The committee on Farmers' Institutes reported as follows, which report was adopted:

MR. PRESIDENT: The committee on Farmers' Institutes respectfully submit the following report to the State Board of Agriculture for its consideration:

In 1895-6 one hundred and fifty-seven regular institutes were held, while this season, under the farmers' institute law as amended April 27, 1896, we will be able to hold two hundred and eleven.

Your committee has, with Secretary W. W. Miller, carefully considered the location and claims of the various places applying for institutes, and we respectfully recommend that institutes be established at the following places for the season of 1896-7:

TOWN	COUNTY	TOWN	COUNTY
Ada	Hardin	Dyesville	Meigs
Adamsville	Muskingum	Edinburg	Portage
Adario	Richland	Enon	Clark
Amanda	Fairfield	Euclid	Cuyahoga
Amesville	Athens	Forest	Hardin
Andover	Ashtabula	Fort Recovery	Mercer
Antwerp	Paulding	Frankfort	Ross
Arcadia	Hancock	Franklin	Warren
Arcanum	Darke	Fredericktown	Knox
Ashville	Pickaway	Freeport	Harrison
Athens	Athens	Fremont	Sandusky
Attica	Seneca	Geneva	Ashtabula
Barnesville	Belmont	Girard	Trumbull
Batavia	Clermont	Gnadenhutten	Tuscarawas
Beach City	Stark	Grand Rapids	Wood
Beallsville	Monroe	Granville	Licking
Beaver Dam	Allen	Greencastle	Fairfield
Bellefontaine	Logan	Greenspring	Seneca
Bellville	Richland	Greenville	Darke
Benton Ridge	Hancock	Greenwich	Huron
Berlin Heights	Erie	Grelton	Henry
Blanchester	Clinton	Grove City	Franklin
Bloomdale	Wood	Gustavus	Trumbull
Bloomington	Fayette	Hamersville	Brown
Blue Ash	Hamilton	Harrod	Allen
Bowling Green	Wood	Haverhill	Scioto
Brunswick	Medina	Hicksville	Defiance
Bryan	Williams	Hillsboro	Highland
Bucyrus	Crawford	Holgate	Henry
Burg Hill	Trumbull	Idaho	Pike
Cable	Champaign	Jackson Center	Shelby
Cadiz	Harrison	Jamestown	Greene
Caledonia	Marion	Jefferson	Ashtabula
Cambridge	Guernsey	Jersey	Licking
Camden	Preble	Keene	Coshocton
Canal Winchester	Franklin	Killbuck	Holmes
Canfield	Mahoning	Kingston	Ross
Cardington	Morrow	Kipton	Lorain
Carrollton	Carroll	Kossuth	Auglaize
Cedarville	Greene	Labelle	Lawrence
Centerville	Montgomery	Lebanon	Warren
Chagrin Falls	Cuyahoga	Leetonia	Columbiana
Chandlerville	Muskingum	Leipsic	Putnam
Chardon	Geauga	Lewisburg	Preble
Chatham	Medina	Liberty Center	Henry
Cherry Fork	Adams	Logan	Hocking
Chester	Meigs	Loudonville	Ashland
Chester Hill	Morgan	Lower Salem	Washington
Clay Chapel	Gallia	Lucas	Richland
Clyde	Sandusky	Madison	Lake
Colerain	Belmont	Mantua Station	Portage
Collinsville	Butler	Marengo	Morrow
Columbus Grove	Putnam	Marion	Marion
Continental	Putnam	Marlboro	Stark
Coolville	Athens	Marysville	Union
Copopa	Lorain	Maumee	Lucas
Creston	Wayne	Mechanicsburg	Champaign
Danville	Knox	Miamisburg	Montgomery
Defiance	Defiance	Milan	Erie
De Graff	Logan	Millersburg	Holmes
Delaware	Delaware	Monroe	Butler
Delta	Fulton	Monroeville	Huron
Dover	Cuyahoga	Montpelier	Williams

TOWN	COUNTY	TOWN	COUNTY
Mt. Blanchard.....	Hancock	Savannah.....	Ashland
Mt. Carmel.....	Clermont	Scioto.....	Scioto
Mt. Healthy.....	Hamilton	Shandon.....	Butler
Mt. Joy.....	Scioto	Shreve.....	Wayne
Mt. Pleasant.....	Jefferson	Sidney.....	Shelby
Mt. Vernon.....	Knox	Smithfield.....	Jefferson
Neptune.....	Mercer	Spencerville.....	Allen
Nevada.....	Wyandot	Sulphur Springs.....	Crawford
New Berlin.....	Stark	Summerfield.....	Noble
New Holland.....	Pickaway	Sunbury.....	Delaware
New Lisbon.....	Columbiana	Sylvania.....	Lucas
New Martinsburg.....	Fayette	Tarleton.....	Pickaway
New Philadelphia.....	Tuscarawas	Thornville.....	Perry
New Plymouth.....	Vinton	Tiffin.....	Seneca
Newtown.....	Hamilton	Troy.....	Miami
New Washington.....	Crawford	Uhrichsville.....	Tuscarawas
New Waterford.....	Columbiana	Uniopolis.....	Auglaize
North Jackson.....	Mahoning	Upper Sandusky.....	Wyandot
North Lima.....	Mahoning	Utica.....	Licking
North Ridgeville.....	Lorain	Vandalia.....	Montgomery
North Springfield.....	Summit	Van Wert.....	Van Wert
Oakwood.....	Paulding	Versailles.....	Darke
Ohio City.....	Van Wert	Vienna Cross Roads.....	Clark
Osborn Corners.....	Summit	Wakeman.....	Huron
Painesville.....	Lake	Warsaw.....	Coshocton
Payne.....	Paulding	Watertown.....	Washington
Piketon.....	Pike	Waterville.....	Lucas
Pitchin.....	Clark	Wauseon.....	Fulton
Piqua.....	Miami	Waynesville.....	Warren
Plain City.....	Madison	West Charleston.....	Miami
Plainfield.....	Coshocton	West Jefferson.....	Madison
Pleasantville.....	Fairfield	West Mansfield.....	Logan
Poe.....	Medina	Westerville.....	Franklin
Port Clinton.....	Ottawa	Westville.....	Champaign
Quaker City.....	Guernsey	White Cottage.....	Muskingum
Rainsboro.....	Highland	Wilkesville.....	Vinton
Rehoboth.....	Perry	Williamsburg.....	Clermont
Richmond.....	Jefferson	Wilmington.....	Clinton
Richwood.....	Union	Windham.....	Portage
Rockford.....	Mercer	Woodfield.....	Monroe
Russellville.....	Brown	Wooster.....	Wayne
Sandusky.....	Erie	Xenia.....	Greene
Sarahsville.....	Noble		

The committee has also considered the claims and qualifications of a large number of persons who desire to engage in the work as lecturers.

From the list some have been selected because of their experience and acceptability in general work; others are given a trial in field work on account of their success in local work.

The State Board of Agriculture having been severely criticized for assigning members of the board to institute work, it is recommended that members of the board be not hereafter employed as farmers' institute lecturers.

The committee, after a careful canvass of the matter, recommends the following list of speakers:

John Begg,	W. D. Gibbs,	C. D. Lyon,
J. H. Brigham,	J. F. Greene,	S. K. McLaughlin,
W. F. Brown,	W. J. Green,	J. L. Roudebush,
Chas. W. Burkett,	J. Fremont Hickman,	Geo. E. Scott,
W. N. Cowden,	Thos. F. Hunt,	Aug. D. Selby,
F. A. Derthick,	S. H. Hurst,	John L. Shawver,
S. H. Ellis,	W. A. Kellerman,	Chas. E. Thorne,
E. E. Elliott,	G. E. Lawrence,	S. H. Todd,
W. W. Farnsworth,	T. C. Laylin,	O. J. Vine,

H. M. Foreman,
C. M. Freeman,

Wm. R. Lazenby,
Teo. F. Longenecker,

C. G. Williams,
F. M. Webster

Your committee recommends that Secretary W. W. Miller be authorized to act for the Board in fixing dates and assigning speakers for the institutes.

Respectfully submitted,

JOSEPH T. ROBINSON,
ALBERT HALE,
C. BORDWELL,
Institute Committee.

On motion, the Board adjourned to meet on the call of the President.

DEPARTMENT OF AGRICULTURE,
COLUMBUS, January 11, 1897,
4.30 o' CLOCK P. M.

The Board met pursuant to call, President Bower in the chair and all members present, except Mr. Grimes.

The minutes of the preceding meeting were read and approved.

The Assistant Secretary presented a written statement of the financial transactions of the Board for the fiscal year 1896, which was approved, after the reading and approval of the report of the auditing committee.

The Secretary reported the condition of the fertilizer work and his method of compelling compliance with the law of the state, and submitted a statement showing the result of his work in license fees turned into the Board's treasury, comparing the same with the amounts received in former years.

The Secretary reported the progress of the farmers' institute work for the present season.

Several communications relative to convention matters were submitted and ordered to be placed on file.

The Secretary reported the work of the committee on improvements as authorized by the Board, stating that owing to the limited means of the Board, the committee had deemed it inexpedient to complete all the improvements and repairs needed on the fair ground buildings, and had therefore only given attention to repairs on the woman's building, which seemed absolutely necessary to the preservation of this structure. The building has been thoroughly overhauled and straightened, being supplied with new piers and supports to make it perfectly sound and safe and even better than the original construction.

On motion of Mr. Kling, the action of the committee and the expense incurred in repairing the woman's building were approved.

On motion, an adjournment was made until 8.30 A. M. Tuesday, January 12, at which date and hour the Board reconvened, with Mr. H. S. Grimes present.

Mr. Ely submitted the following resolution which was unanimously adopted, and the Secretary directed to transmit a certified copy to the President-elect :

Resolved, By the Ohio State Board of Agriculture, convened in annual session in the city of Columbus, this 12th day of January, 1897, that we believe the interest of agriculture will be best subserved by the selection of a practical farmer as United States Secretary of Agriculture; one who is informed in all matters bearing upon this leading industry; a man who is in close touch with and who has the entire confidence of the farmers of the country, and we do most earnestly indorse Col. Jos. H. Brigham as possessing these qualifications in the highest degree, and we therefore most respectfully and earnestly ask his appointment at the hands of President elect McKinley.

Mr. Kling moved that owing to the financial condition of the Board, in the revision of the premium list for the fair of 1897, the amount of money distributed in each department shall remain, practically, the same as the amount offered last year. The motion being supported by Mr. Bordwell, was agreed to.

On motion, the Board proceeded to the revision of the premium list.

On motion of Mr. Clark, the revision of the speed department was referred to the member in charge and the Assistant Secretary.

On motion of Mr. Ely, it was agreed that the premiums and classification in the cattle department remain the same as last year.

On motion of Mr. Ellis, it was agreed that third premium of a white ribbon, throughout the departments of life stock, be abandoned, the exhibitors at the State Fair last year having expressed great dissatisfaction with a third award.

On motion of Mr. Ellis, the farm product, fruit and floral departments were referred to Mr. Hale for revision.

On motion of Mr. Kling, it was ordered that all manufactured articles, tools, etc., heretofore classified and exhibited in the apiarian department be stricken out of that department and be exhibited as other manufactured articles, in the non-premium departments.

It was agreed that the amateur list of plants and flowers be taken out of the woman's department and placed in the regular floral list.

On motion of Mr. Hale, the revision of the woman's department and the department of fine arts was referred to Mr. Grimes and the Secretaries.

On motion of Mr. Bordwell, it was agreed that the State Fair of 1897 be held the week of August 30, 31, and September 1, 2, 3.

On motion of Mr. Hale, the revision of the rules and regulations for the fair, and the fixing of the program was referred to the Secretaries.

On motion of Mr. Ely, the Board adjourned to meet at the call of the President.

THURSDAY EVENING, 8:30 O'CLOCK.

At the close of the State Agricultural Convention, President Bower called the Board together for the transaction of any unfinished business that might be presented. All members were present.

Mr. Kling, who was about to retire as a member of the Board, expressed himself to the members in terms of the highest regard, stating that his associations as a member of the Board had been the most pleasant of his life. He wished for the success of the Board and its individual members, pledging his assistance and support whenever and wherever it was possible to render.

Mr. Ely expressed his personal appreciation of the retiring member, Mr. Kling; the esteem in which he has always been held by his associates on the Board, and their great confidence in his judgment in all matters of business that have been brought to the consideration of the Board. He proposed that each member and officer of the Board extend to Mr. Kling the hand shake of fellowship, which proposition was immediately acted upon.

It was moved by Mr. Grimes that a committee of two be appointed to draft resolutions expressive of the high appreciation of Mr. Kling as a member of this Board, and of the valuable services he has rendered during his several terms as a member and officer. The motion was duly supported.

The Secretary requested the privilege of speaking to the motion, which privilege was readily granted.

The Secretary reiterated and indorsed all that had been said of the retiring member, and most heartily concurred in the sentiments expressed in the motion by Mr. Grimes. He continued by referring to the very cordial relations that have always existed between Mr. Kling and the entire force of the department, as well as with all with whom he came in contact in conducting the business of the fair; he referred especially to his deep interest in every matter requiring the attention and consideration of the Board, and his uniformly sound judgment in disposing of the same. The Secretary expressed his personal and high appreciation of Mr. Kling as a friend and true man, and said that it was with a feeling of pride that he pinned upon that gentleman's bosom the newly adopted and elegant badge of the Board, to remain his property, as a token of well rendered and profitable service to the Board and to the state, and of the esteem and regard in which he has and ever will be held by all his coworkers.

After remarks by others, the motion was put and unanimously adopted by a rising vote.

The President appointed as the committee Mr. Grimes and the Secretary, who reported the following, which was adopted and ordered to be spread upon the minutes:

WHEREAS, Mr. A. H. Kling, of Marion county, has served the Board most acceptably during four terms, as a member, involving a period of eight years, during which time he served two years as its treasurer and one year as its president, and

WHEREAS, His time and earnest attention have always been cheerfully given in the interest of the Board, of agriculture and the state, his counsels being wise and judicious; and

WHEREAS, Mr. Kling is now about to retire as an active member of the Board, therefore,

Resolved, That this Board and the individual members and officers express to him our highest appreciation of friendship and regard, and our acknowledgment of his true worth as a careful, considerate and wise public officer and co-worker in the interest of agriculture and the allied industries.

Resolved, That we regret exceedingly his retirement from the Board, but shall always accord him the warmest welcome in our meetings and at the annual state fairs, and shall invite and appreciate his counsel and advice as an honored ex-member.

Resolved, That the thanks of the Board are due and hereby tendered to Mr Kling for his ardent work and for his many acts of friendship and kindness expressed and extended to the members and officers of the Board during his eight years of faithful and valuable service.

On motion of Mr. Ellis, the Board adjourned *sine die*.

Attest:

W. W. MILLER,
Secretary.

J. W. FLEMING,
Assistant Secretary.

DEPARTMENT OF AGRICULTURE,
COLUMBUS, January 14, 1897,
9:30 O'CLOCK P. M.

The following gentlemen, comprising the State Board of Agriculture for 1897, met for organization:

HOLD-OVER MEMBERS.

J. T. Robinson, Rockaway, Seneca county.
G. Liggett, Watkins, Union county.
L. G. Ely, Fayette, Fulton county.
Albert Hale, Mogadore, Summit county.
H. S. Grimes, Portsmouth, Scioto county.

NEWLY ELECTED MEMBERS.

J. C. Bower, Columbus, Franklin county.
A. J. Clark, Cambridge, Guernsey county.
C. Bordwell, Batavia, Clermont county.
E. C. Ellis, Crestvue, Hamilton county.
J. S. Stuckey, Van Wert, Van Wert county.

The following are the officers :

J. T. Robinson, President.

C. Bordwell, Vice President.

J. C. Bower, Treasurer.

W. W. Miller, Secretary (hold over.)

J. W. Fleming, Assistant Secretary.

Crop and Live Stock Statistics

AS ESTIMATED BY THE

Ohio State Board of Agriculture,

From Returns Received from its Corps of Regular Township Crop Correspondents, During
the season of 1896.

The following crop reports are from the regular monthlies issued by the department, and embrace those which refer to the acreage and production of the principal crops of the state. These reports are based upon estimates returned to the department during the growing and harvesting seasons, by the large corps of correspondents who, as a rule, are practical, intelligent and observing farmers, and their returns can be relied upon as being approximately correct.

The monthly crop reporting system, under the direction of the Department of Agriculture, was inaugurated for the express purpose of furnishing to the producers prompt information bearing on the current year's crops, and that might be of value in determining the underproduction or overproduction of any of the principal crops of the state.

The crop statistics as collected by the township assessors and returned to the county auditors do not reach the State Auditor, and the people, through the state publications, until the crops have long since passed into the hands of the buyers and consumers, and hence are valuable principally as a matter of record, but afford little or no information to the farmer in regard to the disposal of his crops or his seeding for the next year's growth.

Following the crop reports will be found a table showing wheat and corn production from 1850 to 1896, inclusive, together with the range of prices and the average prices for each year, and the same by a series of ten years each.

Following these statistics will be found the number of live stock for the year 1895-6, as returned to the Auditor of State.

AREA OF OATS AND CONDITION OF CROPS, MAY, 1896.

The following estimates are based on reports received from the regular township crop correspondents of the department. In these reports nearly every township of the state is represented, hence the average condition or prospect, as estimated for each county and for the entire state, is from data so general as to warrant the conclusions presented in this report :

WHEAT—Condition compared with an average.....	55 per cent.
BARLEY—Condition compared with an average.....	60 “
RYE—Condition compared with an average.....	68 “
OATS—Area compared with last year.....	103 “
“ Total estimated area for the harvest of 1896.....	989,435 acres.
“ Condition compared with an average.....	92 per cent.
WHEAT—Amount drilled in	93 “
“ Condition of drill.....	57 “
“ Amount sown broadcast.....	7 “
“ Condition of broadcast.....	46 “
WHEAT DAMAGE—By Hessian fly.....	2 “
“ By other insects.....	1 “
CLOVER—Average date of seeding.....	March 20.
“ Area compared with last year....	90 per cent.
LOSSES OF LIVE STOCK DURING THE WINTER AND SPRING—	
HORSES.....	1 per cent.
CATTLE.....	1 “
SHEEP.....	3 “
HOGS	3 “
FRUIT—Buds winter killed	8 “
“ Condition of berry canes.....	86 “

Considerable anxiety has been felt with reference to the wheat crop since the report of April 1st, which report indicated a prospect for little better than half a crop. The weather conditions from seeding time last fall up to the time of the report, April 1st, had been unfavorable to the germination, protection and growth of the plant and much of it had the appearance of being completely winter killed, but conservative farmers and reporters entertained hopes that with warm rains during April the plant would take a start and much which appeared winter killed would be revived and produce a small crop which with the good and fairly good wheat, would make the crop considerably above a half average. These conservative reporters made figures accordingly. The rains came during April and weather conditions were such as to rapidly advance all vegetation, but the hoped for great improvement in wheat has not been realized. It has been proven that a great deal of the wheat was beyond redemption and thousands of acres have been seeded to oats and thousands more plowed for corn. The wheat which had a good stand and pulled through the winter made rapid growth during the month, and dotted over the state, especially in the northern portion, are some fine and promising

fields, but there is a great deal not plowed up that is very thin and spotted. The best prospect is shown throughout the northern counties. The prospect diminishes toward the central and southern counties, in some of which not more than a fourth crop will be realized. The general average for the State for the growing crop is estimated at fifty-five per cent. of a fair average, a reduction of two per cent. since the estimate of last month, and this low estimate of the standing wheat coupled with the reduction in area by reason of plowing up, must result in a greatly reduced product for the coming harvest as compared with average years.

There will be an unusually large acreage of oats and that which is up is in good growing condition. There will also be a large acreage of corn by reason of plowed up wheat.

Pastures and meadows are making fine growth. In reporting fruit buds winter killed, correspondents refer more especially to peaches, and principally in the northern part of the state. In the southern part of the state there is complaint that the apple bloom was not sufficiently large, but there is no general complaint of severe winter killing.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CONDITION OF CROPS AND LIVE STOCK MAY 1, 1896.

Counties.	Wheat.			Oats.				Rye.	Wheat.		
	Condition compared with an average.	Barley.	Condition compared with an average.	Area last year.	Area for 1896 compared with last year.	Total estimated area for the harvest of 1896.	Condition compared with an average.		Amount of drilled.	Condition of drilled.	Amount sown broadcast.
	Per ct.	Per ct.	Per ct.	Acres.	Per ct.	Acres.	Per ct.		Per ct.	Per ct.	Per ct.
Adams.....	50	.....	65	2,432	100	2,432	70		94	58	6
Allen.....	53	.....	57	9,338	98	9,338	93		99	56	1
Ashland.....	62	73	79	18,911	100	18,911	86		96	62	4
Ashtabula.....	59	.....	79	15,031	99	14,881	87		95	60	5
Athens.....	70	.....	82	2,149	100	2,149	98		89	72	11
Auglaize.....	60	62	74	11,255	98	11,030	93		92	58	8
Belmont.....	65	.....	79	10,470	105	10,994	100		81	70	19
Brown.....	49	.....	55	5,050	96	4,848	96		90	50	10
Butler.....	46	38	45	9,394	105	9,864	100		99	46	1
Carroll.....	69	.....	69	14,278	105	14,992	93		90	68	10
Champaign.....	38	.....	90	7,068	115	8,128	95		100	35	.....
Clark.....	61	.....	73	5,293	107	5,664	97		99	62	1
Clermont.....	40	40	48	7,170	100	7,170	82		88	45	12
Clinton.....	33	40	62	4,510	109	4,916	99		99	33	1
Columbiana.....	68	.....	77	19,095	100	19,095	89		92	66	8
Coshocton.....	56	.....	74	8,603	100	8,603	96		96	61	4
Crawford.....	52	.....	33	19,738	101	19,935	99		100	53	.....
Cuyahoga.....	60	.....	64	14,003	100	14,003	88		93	62	7

Counties.

Darke.....	57	65	73	19,631	99	19,435	94	94	62	2	62
Defence.....	61	62	79	16,635	107	17,799	91	91	64	9	49
Delaware.....	30	.....	46	7,696	115	8,850	99	89	29	11	37
Erie.....	62	81	75	12,261	101	12,383	87	93	61	7	40
Fairfield.....	39	40	47	3,087	110	4,056	94	97	44	3	25
Fayette.....	37	40	65	1,119	105	1,174	92	99	38	8	50
Franklin.....	33	30	54	6,416	120	7,699	98	96	33	2	23
Fulton.....	71	65	83	17,888	98	17,530	90	91	72	9	70
Galia.....	62	71	.....	3,011	100	3,011	88	85	68	15	45
Geauga.....	69	50	70	10,613	103	10,931	93	99	68	1	60
Greene.....	30	30	48	4,709	120	5,651	98	99	30	1	29
Guernsey.....	67	75	77	7,975	98	7,895	97	82	74	18	46
Hamilton.....	34	47	46	4,011	107	4,292	99	88	34	12	22
Hancock.....	53	57	67	12,890	108	13,921	96	99	41	1	45
Hardin.....	51	.....	60	17,223	112	19,289	99	94	52	6	45
Harrison.....	60	.....	82	7,088	102	7,230	95	78	59	22	39
Henry.....	72	80	81	8,651	99	8,564	97	93	76	7	76
Highland.....	36	38	50	2,639	102	2,639	91	94	37	6	34
Hocking.....	70	.....	87	2,454	105	2,577	95	98	81	2	60
Holmes.....	63	.....	81	16,684	99	16,517	100	98	64	2	51
Huron.....	58	87	85	26,734	103	27,536	95	98	58	2	60
Jackson.....	56	.....	50	1,817	100	1,817	85	89	65	11	55
Jefferson.....	66	90	86	11,954	101	12,065	95	89	73	11	43
Knox.....	51	.....	67	12,416	102	12,664	99	98	55	2	35
Lake.....	69	.....	81	6,240	99	6,178	83	91	73	9	62
Lawrence.....	67	77	71	3,950	100	3,950	83	83	58	17	58
Licking.....	53	.....	77	9,555	104	9,937	96	97	57	3	49
Logan.....	41	54	67	8,117	111	9,010	95	99	50	1	47
Lorain.....	58	80	70	19,254	102	19,639	83	92	61	8	35
Lucas.....	64	90	65	10,569	101	10,675	89	82	69	18	57
Madison.....	43	40	70	2,799	119	3,330	99	90	52	10	.....
Mahoning.....	51	.....	58	15,856	101	16,015	82	96	55	4	40
Marion.....	43	.....	59	13,276	110	14,634	98	93	44	7	44
Medina.....	49	.....	60	18,222	98	17,858	76	99	49	1	45
Meigs.....	57	90	56	2,282	99	2,259	88	94	53	6	41
Mercer.....	56	46	70	20,035	104	20,836	99	98	58	2	55
Miami.....	62	62	72	13,856	107	14,826	95	98	63	2	80
Monroe.....	73	80	88	8,164	99	8,082	98	86	78	14	59
Montgomery.....	44	40	80	12,763	103	13,146	98	100	50	.....	.....
Morgan.....	64	.....	70	3,940	104	4,098	93	95	67	5	48

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat.		Barley.		Rye.		Oats.				Wheat.									
	Condition compared with an average.	Per ct.	Condition compared with an average.	Per ct.	Condition compared with an average.	Per ct.	Area last year.	Area for 1896 compared with last year.	Acres.	Per ct.	Total estimated area for the harvest of 1896.	Condition compared with an average.	Per c.	Amount of drilled.	Per ct.	Condition of drilled.	Per ct.	Amount sown broadcast.	Per ct.	Condition of broadcast.
Morrow.....		53		.....		60	14,017	100	14,017		14,017		98	95	55				5	38
Muskingum.....		63		71		70	7,234	99	7,162		7,162		97	88	66				12	63
Noble.....		62		.....		70	5,439	101	5,493		5,493		95	81	76				19	47
Ottawa.....		45		.....		70	7,370	102	7,517		7,517		91	83	49				17	46
Paulding.....		63		79		84	7,014	102	7,154		7,154		99	81	70				19	51
Perry.....		68		55		74	5,054	100	5,054		5,054		92	99	69				1	50
Pickaway.....		36		.....		67	1,346	114	1,534		1,534		96	99	37				1	20
Pike.....		38		30		30	4,683	98	4,589		4,589		88	98	34				2	20
Portage.....		63		.....		80	17,363	106	18,405		18,405		91	99	62				1	63
Preble.....		70		70		85	13,058	103	13,450		13,450		98	100	69					
Putnam.....		58		.....		74	4,859	107	5,199		5,199		96	94	60				6	37
Richland.....		51		56		58	25,335	100	25,335		25,335		94	94	54				6	40
Ross.....		45		50		68	2,723	110	2,995		2,995		94	96	43				6	35
Sandusky.....		58		70		76	14,112	103	14,535		14,535		94	97	59				3	63
Scioto.....		66		71		70	4,663	102	4,756		4,756		88	93	70				7	70
Seneca.....		58		61		70	19,829	107	21,217		21,217		99	98	56				2	47
Shelby.....		41		52		59	17,389	104	18,085		18,085		97	98	43				2	35
Stark.....		56		50		68	26,798	102	27,334		27,334		89	96	57				4	48

Summit.....	56	60	67	16,282	100	16,282	88	100	56	.....
Trumbull.....	41	50	44	18,465	100	18,465	74	95	40	32
Tuscarawas.....	56	.....	70	18,435	101	18,619	97	90	61	37
Union.....	38	.....	68	7,107	110	7,818	100	95	33	33
Van Wert.....	71	90	74	11,878	103	12,234	99	96	72	64
Vinton.....	58	50	55	1,755	100	1,755	83	90	63	48
Warren.....	30	32	43	6,577	114	7,498	99	97	32	40
Washington.....	58	.....	70	9,020	99	8,930	96	86	66	48
Wayne.....	54	65	70	24,856	100	24,856	86	99	52	47
Williams.....	68	.....	83	22,275	103	22,943	97	73	75	58
Wood.....	65	79	72	26,925	99	26,656	96	89	68	57
Wyandot.....	55	71	69	11,756	104	12,226	98	98	53	55
Average per cent.....	55	60	68	.....	103	.....	92	93	57	46
Totals.....	.....	.....	.....	964,032	.....	989,435	.....	.....	.....	.....

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat damage.		Clover.		Losses of live stock during the winter and spring.				Fruit.	
	By Hessian fly.	By other insects.	Date of sowing—Days after February 1.	Area compared with last year.	Horses.	Cattle.	Sheep.	Hogs.	Buds winter killed.	Condition of berry canes.
	Per cent	Per cent.	Days.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Adams	2	.....	48	86	1	1	.....	1	2	92
Allen	1	1	49	90	1	1	2	1	2	90
Ashland	5	2	52	92	2	2	2	2	5	92
Ashtabula .....	.....	.....	58	96	1	1	3	4	8	91
Athens .....	.....	.....	53	100	1	.....	1	.....	20	96
Auglaize	1	.....	55	69	3	1	5	2	14	86
Belmont	1	.....	50	93	2	2	5	2	12	91
Brown .....	.....	.....	49	81	1	1	3	2	.....	80
Butler .....	.....	.....	53	88	1	1	2	3	21	93
Carroll	2	3	50	80	2	1	5	2	4	85
Champaign .....	.....	.....	30	100	2	2	5	3	5	87
Clark .....	.....	.....	44	89	2	2	4	5	20	75
Clermont	5	2	46	91	.....	1	2	2	9	87
Clinton	1	.....	47	94	1	1	5	4	12	84
Columbiana	6	3	54	91	2	2	2	2	3	93
Coshocton	1	.....	47	91	.....	1	2	1	4	89
Crawford .....	.....	.....	56	97	1	1	2	1	2	80
Cuyahoga	1	.....	52	91	2	2	4	6	2	91

Darke	3	.....	53	99	2	.....	1	.....	3	2	.....	3	.....	13	90
Defiance	1	.....	51	83	2	.....	1	.....	2	2	.....	3	.....	5	94
Delaware	1	2	59	83	.....	.....	1	.....	2	2	.....	3	.....	1	80
Erie	2	.....	55	81	.....	.....	1	.....	1	1	.....	2	.....	3	89
Fairfield	4	2	50	90	.....	.....	1	.....	1	1	.....	4	.....	7	85
Fayette	1	.....	51	79	.....	.....	1	.....	1	1	.....	7	.....	2	77
Franklin	1	.....	57	89	.....	.....	1	.....	1	1	.....	4	.....	4	82
Fulton .....	.....	1	56	81	.....	.....	.....	.....	1	1	.....	1	.....	11	83
Gallia	3	2	48	93	2	.....	2	.....	.....	2	.....	2	.....	12	100
Geauga .....	.....	1	55	101	.....	.....	1	.....	.....	1	.....	.....	.....	9	96
Greene	2	.....	48	102	.....	.....	.....	.....	.....	.....	.....	6	.....	19	87
Guernsey	2	.....	56	89	.....	.....	2	.....	2	2	.....	3	.....	13	81
Hamilton .....	.....	.....	57	94	.....	.....	2	.....	2	2	.....	3	.....	5	90
Hancock	3	1	51	96	.....	.....	1	.....	1	1	.....	3	.....	2	90
Hardin .....	.....	.....	61	63	.....	.....	.....	.....	2	2	.....	3	.....	5	90
Harrison	1	.....	55	102	.....	.....	1	.....	1	1	.....	2	.....	3	86
Henry	2	.....	57	100	.....	.....	1	.....	1	1	.....	1	.....	15	94
Highland	2	2	43	94	.....	2	.....	.....	1	1	.....	2	.....	6	92
Hocking .....	.....	.....	50	103	.....	.....	.....	.....	1	1	.....	4	.....	6	95
Holmes	4	.....	43	100	.....	.....	.....	.....	1	1	.....	.....	.....	15	90
Huron	1	.....	54	88	.....	.....	.....	.....	2	2	.....	2	.....	13	88
Jackson	1	.....	50	94	.....	.....	1	.....	1	1	.....	1	.....	10	78
Jefferson	1	.....	55	96	.....	.....	1	.....	1	1	.....	1	.....	4	94
Knox	1	.....	49	93	.....	.....	1	.....	1	1	.....	3	.....	2	92
Lake	2	1	53	86	.....	.....	.....	.....	1	1	.....	1	.....	15	73
Lawrence	1	1	49	97	.....	.....	1	.....	1	1	.....	3	.....	23	70
Licking	2	1	50	87	.....	.....	1	.....	1	1	.....	3	.....	5	91
Logan	1	1	49	92	.....	.....	1	.....	1	1	.....	2	.....	8	82
Lorain	1	1	52	81	.....	.....	1	.....	1	1	.....	2	.....	2	70
Lucas	1	.....	53	81	.....	.....	.....	.....	1	1	.....	2	.....	5	91
Madison .....	.....	.....	52	92	.....	.....	2	.....	2	2	.....	3	.....	5	83
Mahoning .....	.....	.....	61	80	.....	.....	2	.....	2	2	.....	4	.....	8	82
Marion	1	1	57	87	.....	.....	1	.....	1	1	.....	3	.....	3	82
Medina	2	.....	49	74	.....	.....	1	.....	1	1	.....	3	.....	2	82
Meigs	3	1	38	94	.....	.....	2	.....	2	2	.....	5	.....	15	76
Mercer	1	1	46	88	.....	.....	1	.....	1	1	.....	1	.....	10	70
Miami	1	2	56	79	.....	.....	1	.....	1	1	.....	2	.....	3	79
Monroe	2	1	45	89	.....	.....	2	.....	2	2	.....	2	.....	21	80
Montgomery .....	.....	.....	54	85	.....	.....	2	.....	2	2	.....	2	.....	14	82
Morgan	1	1	50	87	.....	.....	1	.....	1	1	.....	2	.....	20	82

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat damage.		Clover.		Losses of live stock during the winter and spring.				Fruit.	
	By Hessian fly.	By other insects.	Date of sowing—Days after February 1.	Area compared with last year.	Horses.	Cattle.	Sheep.	Hogs.	Buds winter killed.	Condition of berry canes.
	Per cent.	Per cent.	Days.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Morrow	1	1	50	77	1	.....	2	3	1	94
Muskingum .....	.....	1	53	89	1	2	4	4	11	95
Noble	1	1	43	88	1	1	3	1	11	83
Ottawa .....	.....	.....	52	81	1	.....	1	1	3	85
Paulding	1	.....	56	68	1	.....	1	3	3	75
Perry .....	.....	.....	51	80	1	1	3	1	4	78
Pickaway	1	1	44	79	2	1	3	6	5	81
Pike	1	.....	50	83	1	1	2	3	17	70
Portage	1	.....	53	90	.....	.....	.....	2	6	92
Preble	1	.....	47	89	1	1	2	4	16	76
Putnam	1	2	57	94	1	1	2	3	2	94
Richland	1	1	51	86	1	1	2	4	9	92
Ross	2	1	50	92	1	1	2	6	4	74
Sandusky	2	1	52	88	1	1	2	4	6	90
Scioto	2	.....	43	93	1	1	2	3	8	92
Seneca	1	.....	41	85	1	1	2	3	4	96
Shelby	2	1	50	100	1	.....	1	3	7	85
Stark	1	1	44	83	1	1	1	2	14	81

Summit	53	81	1	1	1	1	1	1	1	2	3	14	80
Trumbull	57	93	1	1	1	1	1	1	1	2	3	10	86
Tuscarawas	52	89	2	1	1	1	1	1	1	4	6	4	88
Union	54	88	1	1	1	1	1	1	1	3	2	5	83
Van Wert	56	66	1	1	1	1	1	1	1	3	3	2	89
Vinton	43	97	1	1	1	1	1	1	1	3	.....	7	93
Warren	46	93	1	1	1	1	1	1	1	1	3	11	86
Washington	46	91	1	1	1	1	1	1	1	3	1	8	83
Wayne	54	92	1	1	1	1	1	1	1	1	2	3	84
Williams	53	97	1	1	1	1	1	1	1	3	2	7	93
Wood	61	91	2	1	1	1	1	1	1	3	4	11	89
Wyandot	50	93	1	1	1	1	1	1	1	3	3	2	93
Average per cent	Mar. 20	90	1	1	1	1	1	1	1	3	3	8	86

ACREAGE AND CONDITION OF CROPS, JULY 1, 1896.

The following report is based on estimates returned by the regular township crop correspondents of the Department. For acreage comparison is made with the area of last year. The returns have been carefully compiled by townships, by counties, and for the state, and represent every township in the state:

WHEAT—Area sown last fall.....	2,251,043 acres.
“ Plowed up this spring.....	11 per cent.
“ Total estimated area for the harvest of 1896.....	2,011,708 acres.
“ Condition compared with an average.....	45 per cent.
BARLEY—Condition compared with an average.....	66 per cent.
RYE—Plowed up this spring.....	5 per cent.
OATS—Condition compared with an average.....	101 per cent.
CORN—Area planted in 1895.	2,853,535 acres.
“ Area planted this year compared with 1895.....	102 per cent.
“ Total estimated area for 1896.....	2,904,815 acres.
“ Condition compared with an average.....	96 per cent.
“ Damage by cut worms.....	5 per cent.
“ Damage by white grub worm.....	2 per cent.
CLOVER—Damage by white grub worm.....	3 per cent.
“ Product per acre.....	1.07 tons.
“ Quality compared with an average.....	76 per cent.
POTATOES—Area planted in 1895.	144,253 acres.
“ Area planted this year compared with 1895.....	95 per cent.
“ Total estimated area for 1896.....	137,162 acres.
“ Condition compared with an average.....	98 per cent.
TOBACCO—Acreage compared with last year.....	82 per cent.
TIMOTHY—Condition compared with an average.....	73 per cent.
HORSES—Condition compared with an average.....	93 per cent.
PASTURES—Condition compared with an average.....	87 per cent.
COLTS—Number compared with an average.....	45 per cent.
CATTLE—Condition compared with an average.....	94 per cent.
CALVES—Number compared with an average.....	84 per cent.

The condition or prospect of wheat shows a still further decline since the report of June 1st, having, according to the reports of our correspondents, dropped four points. During the entire growing season the indications have wavered about the half crop estimate, but as the season advanced it was apparent that the crop would run below rather than above the half average, and now as the harvest is on and the amount of plowed up wheat has been figured approximately, it is evident that the wheat product for the state will be somewhat below one-half of a fair average product. Rust and the ravages of the Hessian fly, which have been quite general over the state, have aided in reducing the prospect. Of the 2,251,043 acres of wheat seeded last fall, it is estimated that 239,335 acres were plowed up this spring, this materially increasing the area of spring crops, oats showing an increase of three per cent. in area as

compared with last year, corn an increase of two per cent. as compared with last year. Last year there was an unusually large area of corn, which large area is increased this year by about 51,000 acres. Generally the corn is in fair condition, while oats are estimated above a fair condition. A very large oats crop is in prospect, and with favorable weather conditions a large corn crop is now anticipated.

The area of potatoes is not quite up to last year. The very low price of this product may have influenced the slight shortage.

Timothy hay is only about three-fourths of a crop. The present report shows a small increase as compared with the estimate of June 1st, the rains in June having caused some little improvement.

AGRICULTURAL REPORT

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE ACREAGE AND CONDITION OF
CROPS, JULY 1, 1896.

Counties.	Wheat.			Barley.	Rye.	Oats.	Corn.								
	Condition compared with an average.	Area sown last fall.	Plowed up this spring.	Total estimated area for the harvest.	Condition compared with an average.	Plowed up and put in other crops.	Condition compared with an average.	Area planted in 1895.	Area this year compared with 1895.	Acres.	Per cl.	Estimated area for 1896.	Condition compared with an average.	Damage by cut worm.	Damage by white grub.
Adams ..	33	17,617	20	14,094	50	13	91	35,426	93	32,946	93	32,946	93	3	4
Allen ..	40	27,021	4	25,940	.....	1	101	34,426	97	33,393	97	33,393	97	9	0
Ashland ..	42	33,230	7	30,903	90	0	101	25,162	102	25,665	93	25,665	93	7	2
Ashtabula ..	45	11,913	6	11,198	70	9	99	9,715	96	9,326	90	9,326	90	6	1
Athens ..	69	7,804	4	7,492	.....	9	103	17,683	96	16,976	99	16,976	99	4	2
Auglaize ..	49	29,412	11	26,177	52	16	102	36,792	99	36,424	94	36,424	94	7	0
Belmont ..	69	22,827	2	22,370	.....	25	102	25,292	107	27,062	102	27,062	102	11	3
Brown ..	28	28,257	6	26,562	.....	0	89	43,277	106	45,874	102	45,874	102	0	1
Butler ..	40	42,748	19	34,626	45	6	105	56,962	106	60,370	104	60,370	104	4	0
Carroll ..	51	17,175	3	16,660	.....	1	97	14,393	99	14,249	95	14,249	95	11	10
Champaign ..	30	47,039	8	43,276	.....	3	100	50,969	110	56,066	105	56,066	105	0	0
Clark ..	51	33,110	16	27,812	.....	20	105	46,802	108	50,546	104	50,546	104	8	0
Clermont ..	26	22,123	13	19,247	55	4	98	34,342	103	35,372	98	35,372	98	1	5
Clinton ..	22	33,569	21	26,520	50	1	104	49,692	108	53,667	105	53,667	105	3	2
Columbiana ..	51	18,317	4	17,554	30	2	101	18,671	98	18,298	94	18,298	94	7	5
Coshocton ..	40	23,621	11	21,023	.....	1	104	25,431	99	24,187	88	24,187	88	7	2
Crawford ..	39	27,940	9	25,425	.....	15	98	35,121	98	35,419	91	35,419	91	2	1
Cuyahoga ..	41	9,528	3	9,242	.....	1	89	10,186	99	10,074	85	10,074	85	4	0

CROP AND LIVE STOCK STATISTICS.

42	Darke	57,679	6	54,218	61	12	105	73,605	105	77,285	3
56	Defance	27,360	7	25,289	70	10	105	24,776	98	23,790	10
32	Delaware	20,352	21	16,078	70	15	107	32,422	109	35,340	5
55	Erie	14,246	13	12,394	83	18	93	17,038	101	17,208	94
30	Fairfield	33,540	14	28,844	35	25	103	49,304	100	49,304	6
24	Fayette	24,442	23	18,820	.....	12	105	50,708	110	55,779	1
25	Franklin	33,020	40	19,812	.....	4	106	59,608	107	63,781	5
63	Fulton	35,720	1	35,363	90	9	95	25,965	104	27,004	2
60	Gallia	14,938	3	14,490	.....	0	102	23,110	100	23,110	5
53	Geauga	6,356	3	6,165	92	10	99	7,783	103	8,016	2
34	Greene	37,402	34	24,685	20	1	105	54,098	111	60,049	6
70	Guernsey	13,796	12	12,140	60	0	96	1,794	96	1,722	3
35	Hamilton	14,393	22	11,227	33	14	105	16,233	102	16,560	2
45	Hancock	44,801	11	39,773	60	4	103	50,252	102	51,257	0
44	Hardin	30,101	24	22,877	.....	5	105	35,630	102	36,343	1
55	Harrison	10,449	8	9,613	.....	3	102	13,809	104	14,361	0
57	Henry	31,479	6	29,590	92	13	100	41,340	101	41,753	2
22	Highland	34,190	7	31,797	37	5	89	48,417	98	47,448	1
76	Hocking	11,168	0	11,168	.....	0	105	14,709	100	14,709	5
31	Holmes	35,978	10	50,380	60	3	99	23,815	100	23,815	0
45	Huron	27,068	12	23,819	93	0	96	26,298	101	26,561	2
62	Jackson	7,612	3	7,384	.....	0	95	13,566	94	12,752	4
69	Jefferson	19,601	5	18,621	.....	0	98	13,731	100	13,731	0
30	Knox	31,570	9	28,729	.....	0	100	32,741	97	31,758	8
58	Lake	4,081	1	4,040	.....	0	89	3,455	91	3,144	3
43	Lawrence	8,630	4	8,285	65	10	96	21,540	99	21,326	2
30	Licking	34,674	10	31,207	.....	0	102	52,425	99	51,901	4
40	Logan	25,501	17	21,166	50	7	92	39,343	99	38,950	6
49	Lorain	16,609	3	16,211	91	2	98	17,013	80	13,610	3
47	Lucas	16,552	3	16,055	95	10	101	18,116	101	18,297	8
31	Madison	25,762	40	15,457	30	10	104	76,663	108	82,793	4
39	Mahoning	12,033	4	11,552	65	1	105	15,835	107	16,943	1
37	Marion	24,415	27	17,823	95	1	100	39,508	98	38,718	0
27	Medina	19,087	4	18,324	.....	0	97	19,154	102	19,537	6
69	Meigs	12,916	7	12,012	.....	0	105	16,554	100	16,554	1
33	Mercer	39,666	12	34,906	.....	2	105	52,413	98	51,365	4
63	Miami	40,283	6	37,866	62	2	101	15,565	98	15,534	7
47	Monroe	20,086	3	19,483	.....	0	104	17,357	97	16,836	5
45	Montgomery	37,084	17	30,780	59	5	105	46,810	105	49,151	5
67	Morgan	10,208	2	10,004	.....	3	103	16,526	102	16,857	6

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat.			Barley.	Rye.	Oats.	Corn.					
	Condition compared with an average.	Area sown last fall.	Plowed up this spring.	Total estimated area for the harvest.	Condition compared with an average.	Plowed up and put in other crops.	Condition compared with an average.	Area planted in 1895.	Area this year compared with 1895.	Acres.	Per ct.	Estimated area for 1896.
	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per ct.	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per ct.
	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per ct.	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per ct.
Morrow	49	15,580	16	13,087	.....	3	106	24,829	102	25,325	91	Damage by white grub
Muskingum	56	21,454	4	20,596	80	0	106	29,135	100	29,135	97	Damage by cut worm.
Noble	75	14,480	10	13,032	.....	0	101	16,963	99	16,793	95	
Ottawa	41	15,766	30	11,036	85	15	98	16,777	93	15,603	85	
Paulding	56	16,080	15	13,668	75	5	105	28,237	105	29,649	101	
Perry	73	13,408	0	13,408	67	16	104	32,906	101	33,235	98	
Pickaway	27	50,836	23	39,144	.....	0	100	69,263	107	74,111	103	
Pike	32	14,359	12	12,636	.....	0	100	20,990	92	19,311	102	
Portage	41	19,857	2	19,460	.....	3	91	20,990	99	15,173	88	
Preble	58	40,556	6	38,123	59	3	109	49,481	104	51,460	95	
Putnam	46	31,363	6	29,481	.....	0	89	48,265	105	50,678	92	
Richland	47	41,588	7	38,677	100	0	100	29,257	98	28,672	95	
Ross	41	37,575	12	33,066	.....	1	104	67,019	99	66,349	108	
Sandusky	49	33,867	15	28,787	85	0	105	36,165	97	35,080	94	
Scioto	55	12,788	3	12,404	55	0	102	20,382	99	20,178	108	
Seneca	49	50,566	9	46,015	75	9	99	43,990	99	43,550	96	
Shelby	35	34,265	8	31,524	55	20	105	41,394	100	41,394	100	
Stark	32	38,788	6	36,461	90	0	96	29,657	95	28,174	92	

Summit.....	36	23,650	6	22,231	.....	3	95	17,755	96	17,045	79	9	2
Trumbull.....	35	10,718	11	9,539	.....	7	99	12,831	102	13,088	89	10	1
Tuscarawas.....	45	26,808	4	25,256	90	0	106	22,076	98	21,634	90	5	2
Union.....	33	22,138	30	15,497	.....	4	105	54,853	105	57,596	98	6	0
Van Wert.....	54	29,224	4	28,055	90	18	103	44,418	99	43,974	99	2	0
Vinton.....	63	7,040	1	6,970	.....	0	104	12,880	101	13,009	102	6	5
Warren.....	18	35,607	30	24,925	42	13	105	56,184	105	58,993	105	3	1
Washington.....	56	28,571	4	27,428	.....	5	101	23,313	100	23,313	98	4	3
Wayne.....	32	44,649	10	40,181	90	1	99	36,565	100	36,565	94	6	3
Williams.....	45	30,683	3	29,762	100	0	103	25,153	100	25,153	100	0	1
Wood.....	58	49,102	11	47,701	82	1	93	71,716	102	73,150	97	4	1
Wyandot.....	51	21,576	12	18,987	50	1	106	30,937	102	31,556	98	6	1
Average per cent.....	45	.....	11	.....	66	5	101	.....	102	.....	96	5	2
Totals.....	.....	2,251,043	.....	2,011,708	.....	.....	.....	2,853,535	.....	2,904,815	.....	.....	.....

AGRICULTURAL REPORT.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Clover.			Potatoes.				Tobacco.	Timothy.	Horses.	Pastures.	Colts.	Cattle.	Calves.
	Damage by white grub worm.	Tons produced per acre.	Quality compared with an average.	Area planted in 1893.	Area this year, compared with 1893.	Estimated area for 1896.	Condition compared with an average.	Acres.	Per cent.	Condition compared with an average.	Per cent.	Condition compared with an average.	Per cent.	Number compared with an average.
	Per ct.	Tons.	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per cent.	Per cent.	Per cent.	Per cent.	Per ct.	Per ct.	Per cent.
Adams	5	1.14	70	249	94	234	103	69	69	94	76	34	89	81
Allen	0	.50	60	1,070	88	942	100	.....	71	87	96	68	94	98
Ashland	10	1.21	95	1,295	93	1,204	95	100	68	94	97	45	99	96
Ashtabula	2	1.48	79	3,623	88	3,188	96	47	78	98	94	44	98	88
Athens	4	1.70	92	1,005	102	1,025	101	.....	70	98	96	42	100	94
Auglaize	6	1.00	84	1,240	93	1,153	96	75	76	86	87	47	91	83
Belmont	0	1.50	75	1,795	96	1,723	105	109	50	97	87	30	99	82
Brown	0	1.00	84	980	101	990	104	65	65	90	88	39	88	81
Butler	5	.67	62	1,773	98	1,737	103	52	65	99	92	50	98	80
Carroll	10	1.14	71	787	72	567	94	.....	69	88	93	30	82	78
Champaign	0	.30	25	1,202	95	1,135	103	100	100	90	85	33	90	83
Clark	0	.80	66	1,573	98	1,542	104	.....	73	96	86	55	95	84
Clermont	3	.89	83	1,691	103	1,742	105	87	63	98	93	27	98	89
Clinton	3	1.05	84	3,303	98	3,237	105	58	64	96	85	38	90	92
Columbiana	4	1.05	85	2,174	83	1,804	89	5	62	91	92	57	89	80
Coshocton	4	1.38	82	1,305	95	1,240	98	.....	75	90	85	35	94	85
Crawford	0	.85	66	1,385	85	1,177	94	.....	67	92	93	44	95	92
Cuyahoga	1	1.38	88	6,090	96	5,846	80	.....	78	96	95	35	100	57
Marion	2	.94	87	2,523	100	2,523	106	82	82	99	89	67	96	87

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Concluded.

Counties.	Clover.			Potatoes.				Tobacco.	Timothy.	Horses.	Pastures.	Colts.	Cattle.	Calves.
	Damage by white grub worm.	Tons produced per acre.	Quality compared with an average.	Area planted in 1895.	Area this year compared with 1895.	Estimated area for 1896.	Condition compared with an average.	Acres compared with last year.	Condition compared with an average.	Condition compared with an average.	Condition compared with an average.	Number compared with an average.	Condition compared with an average.	Number compared with an average.
	Per ct.	Tons.	Per ct.	Acres.	Per ct.	Acres.	Per ct.	Per cent.	Per cent.	Per cent.	Per cent.	Per ct.	Per ct.	Per cent.
Morrow	1	.97	76	1,505	96	1,445	98	100	74	98	100	54	98	82
Muskingum	1	1.02	78	1,615	95	1,534	101	100	76	99	105	41	98	89
Noble	10	1.00	77	765	99	757	101	95	67	84	99	46	91	78
Ottawa	0	1.00	75	769	89	684	85	.....	93	93	75	75	93	80
Paulding	8	1.00	85	714	95	678	98	80	84	95	89	58	90	89
Perry	8	1.25	84	730	104	759	102	.....	74	91	102	34	96	96
Pickaway	1	1.11	62	1,108	94	1,042	101	.....	68	98	91	46	92	85
Pike	1	1.00	63	515	97	500	103	.....	60	70	72	23	82	80
Portage	4	1.14	75	5,366	96	5,151	95	.....	73	99	96	46	99	84
Preble	10	1.42	43	768	91	699	103	77	67	86	39	49	85	86
Putnam	0	1.25	80	3,229	98	3,164	95	.....	86	100	89	49	95	86
Richland	15	1.00	60	2,070	88	1,822	93	.....	80	93	98	33	97	78
Ross	2	1.10	70	1,960	89	1,674	102	95	74	86	91	46	91	84
Sandusky	0	.90	86	2,389	89	2,126	92	.....	79	95	92	54	90	84
Scioto	2	1.33	83	1,039	103	1,070	101	88	62	100	94	51	90	85
Seneca	0	.71	64	1,957	96	1,879	94	.....	72	90	87	56	90	82
Shelby	6	.50	50	972	98	953	105	100	45	95	90	40	100	90
Stark	2	1.00	71	2,897	90	2,607	88	.....	64	89	79	36	88	70
Summit	2	1.05	63	2,494	90	2,245	87	.....	71	93	100	28	100	90

[illegible]

ACREAGE, PRODUCT AND CONDITION OF CROPS, OCTOBER 1, 1896.

The following report presents the estimate of production in bushels, for wheat, oats, barley and rye, as based upon returns of actual threshing throughout the several counties of the state. The average product per acre of the grain threshed, being applied to the total area for harvest, the result secured is the most reliable and correct possible to secure in estimating total production.

WHEAT—Area sown last fall.....	2,251,043 acres.
“ Plowed up this spring.....	11 per cent.
“ Total estimated area for the harvest of 1896.....	2,011,708 acres.
“ Product per acre estimated from threshers' reports...	8.53 bushels.
“ Total estimated product for 1896.....	17,269,545 “
“ Quality compared with an average	61 per cent.
“ Crop of 1895 still in producers' hands	11 “
OATS—Estimated area for the harvest of 1896.....	989,435 acres.
“ Product per acre estimated from threshers' reports.....	31 bushels.
“ Total estimated product for 1896.....	30,670,306 “
“ Quality compared with an average.....	68 per cent.
BARLEY—Area sown last fall.....	14,400 acres.
“ Product per acre estimated from threshers' reports...	21 bushels.
“ Total estimated product for 1896.....	303,839 “
“ Quality compared with an average.....	71 per cent.
RYE—Area sown last fall.....	37,311 acres.
“ Product per acre estimated from threshers' reports	13 bushels.
“ Total estimated product for 1896.....	486,738 “
CORN—Prospects compared with an average.....	98 per cent.
POTATOES—Probable total compared with an average.....	83 “
TOBACCO—Condition compared with an average.....	87 “
PASTURES—Condition compared with an average.....	101 “
APPLES—Prospect compared with an average	66 “

This report estimated in bushels, and especially that for wheat, verifies conclusively the abnormally short crop so forcibly indicated by the percentage estimates made during the growing and harvest seasons, which percentage estimates kept declining from month to month until it seemed almost a certainty that the wheat crop must result in a total product considerable less than one-half of a fair average. The result of threshing, as indicated in this report, proves the crop to be but about thirty-five to forty per cent. of a fair average for the state.

The total wheat produced for this year is 17,269,545 bushels, being the lowest total product since 1876 when the amount was 15,000,000 bushels. Last year the wheat crop was a short one, being but slightly above one-half of a fair average, but this year the crop falls about 9,000,000 bushels below the short crop of 1895, and about 33,000,000 bushels below the crop of 1894, which was above an average one.

This exceedingly short wheat crop of 1896 is attributable to several causes, the foundation, however, being laid by severe winter killing. Conditions were unfavorable at seeding time last fall and the plant did not become sufficiently set and vigorous to withstand the winter and the freezing and thawing that occurred during March. Rust and the ravages of the Hessian fly were also aids to the reduction and at harvest time wet weather added still another injury and in many cases total loss.

Eleven per cent. of the wheat seeded last fall was plowed up in the spring and put to other crops, thus reducing the area for harvest about 240,000 acres. The average product per acre is 8.53 bushels. Many counties show as low as three and four bushels per acre and ranging from this up to fourteen bushels per acre. The lowest product is shown in the central and southwestern portions of the state, and the highest in the northern and especially the northwestern portions.

Oats was a large acreage and exceedingly promising for an abundant crop until just before harvest when the continuous heavy rains delayed cutting. Some fields were so badly water soaked that the crop was ruined and left standing, while a large amount of oats that was cut and in the shock became damaged or was a total loss.

Potatoes produced well, but owing to the very wet season many have rotted in the ground and will not be dug.

Apples are abundant though not of uniform production throughout the state. In some counties the product is from fair to average and even above the average, while in other counties the crop is from short to fair; however, there is a great abundance, and at prices so low that farmers cannot afford to pick and market.

AGRICULTURAL REPORT.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE ACREAGE, PRODUCT AND CONDITION
OF CROPS, OCTOBER 1, 1896.

Counties.	Wheat.					Oats.					
	Area sown last fall.	Plowed up this spring.	Total estimated area for the harvest of 1896.	Product per acre, estimated from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.	Crop of 1895 still in producers' hands.	Estimated area for the harvest of 1896.	Product per acre, estimated from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.
	Acres.	Per ct.	Acres.	Bushels.	* Bushels.	Per ct.	Per ct.	Acres.	Bushels.	Bushels.	Per ct.
Adams	17,617	20	14,094	6	84,564	68	7	2,432	20	48,640	75
Allen	27,021	4	25,940	8	207,520	48	9	9,739	25	243,475	48
Ashland	33,230	7	30,903	7	216,321	65	12	18,911	32	605,152	90
Ashtabula	11,913	6	11,198	7	78,386	59	11	14,881	34	505,954	86
Athens	7,804	4	7,492	9	67,428	78	15	2,149	27	58,023	79
Auglaize	29,412	11	26,177	11	287,947	48	12	11,030	32	352,960	50
Belmont	22,827	2	22,370	14	313,180	75	12	10,994	29	318,826	80
Brown	28,257	6	26,562	5	132,810	52	18	4,848	20	96,960	50
Butler	42,748	19	34,626	8	277,008	69	4	9,894	36	355,104	71
Carroll	17,175	3	16,660	9	149,940	72	12	14,992	27	404,784	80
Champaign	47,039	8	43,276	6	249,656	40	12	8,128	24	195,072	50
Clark	33,110	16	27,812	11	305,932	49	17	5,664	32	181,248	55
Clermont	22,123	13	19,247	3	57,741	44	12	7,170	21	150,570	47
Clinton	33,569	21	26,520	3	79,560	42	6	4,916	27	132,732	58
Columbiana	18,317	4	17,554	9	157,986	79	7	19,095	32	611,040	86
Coshocton	23,621	11	21,023	5	105,115	73	7	8,603	27	232,281	80
Crawford	27,940	9	25,425	7	177,975	57	7	19,935	36	717,660	72
Cuyahoga	9,528	3	9,242	9	83,178	65	20	14,003	37	518,111	76

Darke	57,679	6	54,218	7	379,526	69	15	19,435	30	583,050	67
Defiance	27,300	7	25,289	10	252,890	45	3	17,799	25	444,975	51
Delaware	20,352	21	16,078	4	64,312	44	14	8,850	33	292,050	52
Erie	14,246	13	12,394	10	123,940	91	16	12,383	31	383,873	82
Fairfield	33,540	14	28,844	6	172,064	45	14	4,056	27	109,512	51
Fayette	24,442	23	18,820	4	75,280	45	23	1,174	29	34,046	60
Franklin	33,020	40	19,812	4	79,248	36	14	7,699	31	238,669	40
Fulton	35,720	1	35,363	13	459,719	51	5	17,530	23	403,190	62
Gallia	14,938	3	14,490	10	144,900	73	4	3,011	21	63,231	82
Geauga	6,356	3	6,165	8	49,320	73	6	10,931	36	393,516	82
Greene	37,402	31	24,685	4	98,740	26	6	5,651	29	163,879	40
Guernsey	13,796	12	12,140	10	121,400	70	8	4,292	22	173,690	61
Hamilton	14,393	22	11,227	5	56,135	45	17	13,921	26	158,804	47
Hancock	44,801	11	39,773	7	318,184	45	10	19,289	37	361,946	62
Hardin	30,101	24	22,877	8	160,139	58	5	7,230	34	238,590	91
Harrison	10,449	8	9,613	10	96,130	76	7	8,564	38	325,432	55
Henry	31,479	6	29,590	10	295,900	43	5	8,564	33	85,041	78
Highland	34,190	7	31,797	5	158,985	56	14	2,639	27	71,253	61
Hocking	11,168	.....	11,168	11	122,848	87	20	2,577	33	412,925	81
Holmes	35,978	10	32,380	4	129,520	66	4	16,517	25	826,080	76
Huron	27,068	12	23,819	8	190,552	49	18	27,536	30	54,510	97
Jackson	7,612	3	7,384	11	81,224	83	15	1,817	30	422,275	68
Jefferson	19,601	5	18,621	15	279,315	84	14	12,065	35	374,592	70
Knox	31,570	9	28,729	5	143,645	62	4	12,064	28	222,408	86
Lake	4,081	1	4,040	10	40,400	70	15	6,178	36	82,950	81
Lawrence	8,630	4	8,285	9	74,565	67	4	3,950	21	308,047	66
Licking	34,674	10	31,207	7	218,449	58	13	9,937	31	261,290	61
Logan	25,501	17	21,166	10	211,660	42	7	9,010	29	628,448	75
Lorain	16,609	3	16,211	8	129,688	52	20	19,639	32	341,600	69
Lucas	16,552	3	16,055	15	240,825	55	5	10,675	32	89,910	42
Madison	25,762	40	15,457	5	77,285	46	6	3,330	27	560,315	89
Mahoning	12,033	4	11,552	6	69,312	56	15	16,015	35	467,328	89
Marion	24,415	27	17,823	7	124,761	48	10	14,604	32	642,888	80
Medina	19,087	4	18,324	6	109,944	53	10	17,858	36	67,770	87
Meigs	12,916	7	12,012	13	156,156	74	18	2,259	30	687,588	54
Mercer	39,666	12	34,906	9	314,154	50	6	20,836	33	459,606	65
Miami	40,283	6	37,866	12	454,392	81	15	14,826	31	193,968	69
Monroe	20,086	3	19,483	13	253,279	74	8	8,082	24	420,672	90
Montgomery	37,084	17	30,780	9	277,020	60	3	13,146	32	98,352	63
Morgan	10,208	2	10,004	15	150,060	73	13	4,098	24		

AGRICULTURAL REPORT.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat.						Oats.				
	Area sown last fall.	Plowed up this spring.	Total estimated area for the harvest of 1896.	Product per acre, estimated, from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.	Crop of 1895 still in producers' hands.	Estimated area for the harvest of 1896.	Product per acre, estimated, from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.
	Acres.	Per ct.	Acres.	Bushels.	Bushels.	Per ct.	Per ct.	Acres.	Bushels.	Bushels.	Per ct.
Morrow	15,580	16	13,087	9	117,783	56	19	14,017	34	476,578	63
Muskingum	21,454	4	20,596	16	329,536	80	6	7,162	33	236,346	66
Noble	14,480	10	14,352	11	143,352	76	20	5,493	28	153,804	71
Ottawa	15,766	30	11,036	9	99,324	60	20	7,517	31	233,027	63
Paulding	16,080	15	13,668	10	136,680	36	6	7,154	25	178,850	50
Perry	13,408	.....	13,408	15	201,120	80	12	5,054	24	121,296	61
Pickaway	50,836	23	39,144	6	234,864	42	7	1,534	31	47,554	60
Pike	14,359	12	12,636	8	101,088	67	10	4,589	25	114,725	60
Portage	19,857	2	19,460	7	136,220	66	9	18,405	36	662,580	87
Preble	40,556	6	38,123	9	343,107	72	6	13,450	28	376,600	58
Putnam	31,363	6	29,481	13	380,253	68	11	5,199	28	145,572	51
Richland	41,588	7	38,677	11	425,447	68	12	25,335	38	952,730	73
Ross	37,575	12	33,066	9	297,594	55	29	2,995	32	95,840	70
Sandusky	33,867	15	28,787	10	287,870	50	18	14,535	33	479,655	65
Scioto	12,788	3	12,404	11	136,444	73	23	4,756	30	142,680	67
Seneca	50,566	9	46,015	10	460,150	59	19	21,217	32	678,944	85
Shelby	34,265	8	31,524	8	252,192	60	4	18,085	28	506,380	58
Stark	38,788	6	36,461	7	255,227	58	5	27,334	34	929,356	76

Summit.....	23,650	6	22,231	10	222,310	67	8	16,282	38	618,716	82
Trumbull.....	10,718	11	9,539	5	47,895	70	10	18,465	37	688,205	75
Tuscarawas.....	26,868	4	25,256	8	202,048	60	15	18,619	29	539,951	74
Union.....	22,138	30	15,497	5	77,485	59	3	7,818	26	203,268	60
Van Wert.....	29,224	1	28,055	10	280,550	43	4	12,234	20	244,680	42
Vinton.....	7,040	1	6,970	10	69,700	71	15	1,755	23	40,365	78
Warren.....	35,607	30	24,925	5	124,625	53	3	7,498	29	217,442	82
Washington.....	28,571	4	27,428	15	411,420	79	8	8,930	30	267,900	71
Wayne.....	44,649	10	40,184	10	401,840	50	7	24,856	38	944,528	79
Williams.....	30,683	3	29,762	8	238,096	38	5	22,943	27	619,461	62
Wood.....	49,102	11	47,701	15	715,515	58	13	26,656	29	773,024	52
Wyandot.....	21,576	12	18,987	8	151,896	66	11	12,226	37	452,362	88
Totals.....	2,251,043	.....	2,011,708	.....	17,269,545	.....	.....	989,435	.....	30,670,306	.....
Average per cent.....	.....	11	.....	8.53	.....	61	11	.....	31	.....	68

AGRICULTURAL REPORT

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Barley.				Rye.			Corn.	Potatoes.	Tobacco.	Pastures.	Apples.
	Area sown last fall.	Product per acre, estimated from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.	Acres.	Bush.	Bushels.	Per cent	Prospect compared with an average.	Probable total, compared with an average.	Condition compared with an average.	Prospect compared with an average.
Acres.	Bush.	Bushels.	Per ct	Acres.	Bush.	Bushels.	Per cent	Per cent.	Per cent.	Per cent.	Per cent.	Per ct.
Adams.....	9	20	180	70	252	6	1,512	105	98	97	92	22
Allen.....	16	21	336	85	343	12	4,116	101	94	105	102	80
Ashland.....	145	17	2,465	68	145	15	2,175	98	96	100	106	104
Ashtabula.....	542	15	8,130	60	394	13	5,122	91	93	.....	106	115
Athens.....	15	18	270	60	43	10	430	89	101	.....	99	38
Auglaize.....	401	29	11,629	68	340	10	3,400	94	85	.....	97	51
Belmont.....	32	11	352	70	146	14	2,044	100	61	100	102	54
Brown.....	20	11	220	70	964	8	7,712	87	92	79	97	20
Butler.....	1,569	27	43,363	77	383	9	3,447	105	106	100	105	19
Carroll.....	29	10	290	75	196	24	4,704	82	82	.....	91	110
Champaign.....	10	15	150	68	351	14	4,914	95	65	.....	110	55
Clark.....	47	20	940	60	872	19	16,568	103	82	.....	104	25
Clermont.....	4	16	64	85	918	6	5,508	106	86	89	101	17
Clinton.....	65	14	910	70	151	9	1,359	106	92	77	105	20
Columbiana.....	36	20	720	90	243	13	3,159	104	96	.....	106	110
Coshocton.....	2	18	36	90	207	16	3,312	94	100	100	100	91
Crawford.....	176	15	2,640	80	173	15	2,595	83	72	.....	106	103
Cuyahoga.....	20	10	200	79	580	22	12,760	95	66	100	107

CROP AND LIVE STOCK STATISTICS.

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Darke.....	510	24	12,288	91	849	13	11,037	105	101	82	94	19
Defiance.....	217	12	2,604	50	364	12	4,368	102	81	100	105	60
Delaware.....	7	10	70	80	186	15	2,790	108	76	100	110	101
Erie.....	1,286	22	28,292	67	506	10	5,060	98	82	.....	102	102
Fairfield.....	17	15	255	62	131	13	1,703	89	87	.....	98	30
Fayette.....	26	18	468	70	290	14	4,060	105	90	.....	105	25
Franklin.....	23	20	460	87	86	10	860	99	61	.....	103	53
Fulton.....	325	15	4,875	87	697	12	8,364	100	63	.....	104	100
Gallia.....	9	20	180	80	75	12	900	103	107	100	95	20
Geauga.....	13	17	221	80	72	10	720	102	92	.....	100	105
Greene.....	80	24	1,920	80	455	12	5,460	84	70	93	101	40
Guernsey.....	16	21	336	77	372	14	5,208	78	91	100	103	20
Hamilton.....	296	10	2,960	75	806	8	6,448	103	90	85	96	25
Hancock.....	27	10	270	40	910	9	8,190	93	85	.....	106	66
Hardin.....	5	11	55	60	552	9	4,968	102	52	75	108	90
Harrison.....	14	25	3,600	45	60	10	600	97	94	.....	100	95
Henry.....	10	30	300	75	3,442	15	51,630	105	77	.....	105	87
Highland.....	11	15	165	80	268	13	3,484	105	93	85	91	25
Hocking.....	86	9	774	60	78	13	1,014	97	103	.....	100	32
Holmes.....	187	10	1,870	60	492	8	3,956	94	88	97	103	84
Huron.....	2	14	28	75	202	14	2,828	96	77	.....	106	103
Jackson.....	75	18	1,350	80	36	15	540	100	101	.....	74	65
Jefferson.....	18	9	162	60	340	10	3,400	101	92	.....	105	84
Knox.....	172	12	2,064	70	517	12	6,204	88	86	.....	108	87
Lake.....	11	30	330	80	132	16	2,112	103	97	94	94	25
Lawrence.....	23	20	460	80	347	12	4,164	101	90	.....	98	86
Licking.....	124	21	2,604	78	330	11	3,630	102	91	.....	100	59
Logan.....	15	15	5,490	97	207	14	2,898	94	73	.....	88	109
Loran.....	567	24	13,128	72	1,398	19	26,562	106	82	.....	106	110
Lucas.....	11	22	242	68	393	9	3,537	103	92	.....	107	68
Madison.....	31	23	713	70	327	12	3,924	93	89	.....	99	106
Mahoning.....	62	25	1,550	82	221	11	2,431	91	78	.....	107	105
Marion.....	32	19	608	80	52	9	468	103	94	100	106	106
Medina.....	48	24	1,152	88	34	15	510	94	93	58	94	24
Meigs.....	493	22	10,846	90	746	14	10,444	96	98	.....	103	87
Mercer.....	458	23	10,534	72	198	17	3,366	93	91	85	105	20
Miami.....	2	20	40	80	238	16	3,808	92	68	89	99	40
Monroe.....	545	30	16,350	80	464	20	9,280	105	97	90	100	15
Montgomery.....	.....	.....	.....	.....	82	17	1,394	98	102	75	109	16

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Barley.				Rye.		Corn.	Potatoes.	Tobacco.	Pastures.	Apples.
	Area sown last fall.	Product per acre, estimated from threshers' reports.	Total estimated product for 1896.	Quality compared with an average.	Area sown last fall.	Product per acre, estimated from threshers' reports.	Total estimated product for 1896.	Prospect compared with an average.	Condition compared with an average.	Condition compared with an average.	Prospect compared with an average.
	Acres.	Bush.	Bushels.	Per ct.	Acres.	Bush.	Bushels.	Per cent.	Per cent.	Per cent.	Per ct.
Morrow.....	16	20	320	80	638	12	7,656	79	100	108	98
Muskingum.....	25	20	500	100	1,411	10	14,110	98	75	101	66
Noble.....	.....	.....	.....	.....	69	15	1,035	88	98	105	40
Ottawa.....	1,539	26	40,014	60	388	15	5,820	87	.....	100	88
Paulding.....	31	22	682	70	830	15	12,450	62	80	107	72
Perry.....	8	24	192	70	156	14	2,184	96	.....	103	42
Pickaway.....	10	20	200	70	130	18	2,340	101	.....	100	20
Pike.....	136	20	2,720	72	2	10	20	106	80	90	25
Portage.....	91	16	1,456	81	167	9	1,503	83	.....	103	110
Preble.....	187	17	3,179	50	307	12	3,684	108	90	105	45
Putnam.....	81	25	2,025	45	1,049	17	17,833	81	90	104	69
Richland.....	199	22	4,378	62	559	9	5,031	85	.....	104	86
Ross.....	23	20	460	70	193	20	3,860	65	100	100	40
Sandusky.....	328	22	7,216	69	617	15	9,255	88	.....	98	95
Scioto.....	22	19	418	70	80	15	1,200	60	70	95	36
Seneca.....	62	14	868	80	433	17	7,361	80	75	100	90
Shelby.....	524	17	5,501	70	300	9	2,700	92	88	106	25
Stark.....	75	11	825	80	196	11	2,156	80	.....	90	85

Summit.....	18	10	180	82	139	13	1,807	90	78	.....	104	84
Trumbull.....	18	10	180	70	134	8	1,072	95	84	.....	97	110
Tuscarawas.....	37	11	470	78	181	12	2,172	88	79	.....	104	99
Union.....	5	14	70	80	428	9	3,852	106	79	.....	94	108
Van Wert.....	180	23	4,140	58	2,172	11	23,892	93	69	.....	110	100
Vinton.....	2	12	24	60	85	14	1,190	100	102	69	107	24
Warren.....	510	16	8,160	90	431	11	4,741	108	102	93	96	20
Washington.....	5	23	115	90	163	15	2,445	100	93	92	101	30
Wayne.....	48	20	960	75	145	16	2,320	95	85	87	98	76
Williams.....	108	11	1,188	85	242	11	2,662	103	62	.....	107	90
Wood.....	606	15	15,150	38	1,660	17	28,220	91	81	.....	101	65
Wyandot.....	28	19	532	73	360	14	5,040	98	89	100	108	105
Totals.....	14,400	.....	303,839	.....	37,311	.....	486,738	.....	.....	.....	.....	.....
Average per cent.....	.....	21	.....	71	.....	13	.....	98	83	87	101	66

ACREAGE AND CONDITION OF CROPS, NOVEMBER 1, 1896.

The following report is based on estimates returned by the regular township crop correspondents of the Department, compiled for each county and for the state. For acreage, comparison is made with last year's seeding.

WHEAT—Area sown last fall.....	2,251,043 acres.
“ Area sown this fall compared with last year.....	96 per cent.
“ Estimated area seeded for the harvest of 1897.....	2,161,295 acres.
“ Condition compared with an average.....	93 per cent.
“ Average date of seeding.....	Sept. 23.
“ Condition of soil at time of seeding	Good.
BARLEY—Area sown last fall.....	14,400 acres.
“ Area sown this fall compared with last year.....	97 per cent.
“ Estimated area seeded for the harvest of 1897.....	13,925 acres.
“ Condition compared with an average.....	94 per cent.
RYE—Area sown last fall.....	37,311 acres.
“ Area sown this fall compared with last year	95 per cent.
“ Estimated area seeded for the harvest of 1897	35,675 acres.
CORN—Prospect compared with an average.....	100 per cent.
BUCKWHEAT—Prospect compared with an average.....	89 per cent.
CLOVER SEED—Prospect compared with an average.....	54 per cent.
POTATOES—Estimated area planted	137,162 acres.
“ Average product per acre.....	93 bushels.
“ Total estimated product.....	12,852,147 “
“ Affected by rot.....	7 per cent.
APPLES—Product compared with an average.....	64 “
HOGS—Condition compared with an average.....	94 “
“ Number to be fattened compared with last year.....	88 “
COMMERCIAL FERTILIZERS—Farmers using on wheat	36 “

The area of wheat sown this fall for the harvest of next year, is estimated to be six per cent less in amount than the area seeded in the fall of 1895, though the total acres are more than was actually harvested the present year, for the reason that about eleven per cent of the wheat seeded in the fall of 1895 was plowed up the following spring. The condition of soil at time of seeding was generally good. The average date of seeding was a little late, farmers fearing the fly. The present condition of the plant is fairly good, though Hessian fly is reported as prevalent in some localities and working on the wheat, especially that sown early. The late sown is a little backward but general conditions are favorable to the plant and its preparation for the winter.

Corn is a good crop, that on hill and well drained land excellent. Some of the corn on clay and low flat lands is not curing out well and is therefore slow in being cribbed. Corn fodder on the low wet lands is somewhat moldy.

This is the first estimate of the potato crop in bushels. The product per acre shows a good average, but there is a general report of rot, which must affect the crop to a considerable extent.

Apples are an abundant crop, though very unevenly distributed over the state.

Hog cholera is reported as prevailing in several counties of the state, and in some to an alarming extent. The following counties are particularly noticed: Allen, Clark, Clinton, Defiance, Franklin, Green, Hancock, Highland, Licking, Marion, Paulding, Preble, Pickaway, Ross, Shelby and Union. With the exception of counties where cholera prevails, the condition of hogs is fairly good. The number for fattening is less than last year.

AGRICULTURAL REPORT

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE ACREAGE, AND CONDITION OF CROPS,
NOVEMBER 1, 1896.

Counties.	Wheat.					Barley.			
	Area sown last fall.	Area sown this fall, compared with last year.	Estimated area seeded for the harvest of 1897.	Condition compared with an average.	Wheat sown, days after September 1.	Condition of soil at time of seeding.	Area sown last fall.	Area sown this fall compared with last year.	Estimated area seeded for the harvest of 1897.
	Acres.	Per cent	Acres.	Per cent		Good.	Acres.	Per cent	Acres.
Adams	17,617	94	16,550	95	29	"	9	100	9
Allen	27,021	92	23,858	80	30	"	16	90	14
Ashland	33,230	96	31,901	93	15	"	145	96	139
Ashtabula	11,913	98	11,575	100	18	"	542	100	542
Athens	7,804	96	7,582	95	28	"	15	100	15
Auglaize	29,412	97	28,530	90	20	"	401	90	361
Belmont	22,827	96	21,914	98	19	"	32	100	32
Brown	28,257	90	25,431	95	35	"	20	100	20
Butler	42,748	100	42,748	100	27	"	1,569	91	1,428
Carroll	17,175	98	16,832	90	16	"	29	100	29
Champaign	47,039	96	45,157	94	27	"	10	100	10
Clark	33,110	91	30,130	92	27	"	47	100	47
Clermont	22,123	92	20,353	100	27	"	4	100	4
Clinton	33,569	98	32,898	94	24	"	65	100	65
Columbiana	18,317	100	18,317	97	17	"	36	100	36
Coshocton	23,621	90	21,259	89	21	"	2	100	2
Crawford	27,940	90	25,146	80	13	"	176	100	176
Cuyahoga	9,528	96	9,147	92	18	"	20	100	20

CROP AND LIVE STOCK STATISTICS.

Darke.....	57,679	100	57,679	90	19	Good.	510	95	485	90
Defiance.....	27,300	95	25,935	90	25	"	217	100	217	80
Delaware.....	20,352	85	17,299	70	28	Fair.	7	100	7	90
Erie.....	14,246	102	14,531	99	19	Good.	1,286	90	1,157	91
Fairfield.....	33,540	95	31,863	88	17	"	17	100	17	90
Fayette.....	24,442	100	24,442	102	21	"	26	105	27	100
Franklin.....	33,020	90	29,718	85	19	"	23	100	23	90
Fulton.....	35,720	98	35,006	93	21	"	325	100	325	93
Gallia.....	14,938	95	14,191	90	35	"	9	100	9	95
Geauga.....	6,356	90	5,720	87	17	"	13	100	13	85
Greene.....	37,402	96	35,906	90	30	Fair.	80	100	80	90
Guernsey.....	13,796	102	14,072	90	21	Good.	16	100	16	90
Hamilton.....	14,393	105	15,113	102	21	"	296	100	296	100
Hancock.....	44,801	97	43,457	100	26	"	27	100	27	100
Hardin.....	30,101	99	29,800	91	27	"	25	100	25	100
Harrison.....	10,449	100	10,449	96	17	Fair.	5	100	5	90
Henry.....	31,479	98	30,849	94	19	Good.	144	100	144	95
Highland.....	34,190	95	32,481	80	28	"	10	100	10	80
Hocking.....	11,168	95	10,610	95	31	"	11	100	11	95
Holmes.....	35,978	101	36,338	95	18	"	86	100	86	95
Huron.....	27,068	97	26,260	97	18	"	187	100	187	100
Jackson.....	7,612	95	7,231	96	40	"	2	100	2	100
Jefferson.....	19,601	99	19,405	103	22	"	75	100	75	100
Knox.....	31,570	95	29,992	92	21	"	18	100	18	100
Lake.....	4,081	95	3,877	90	20	"	172	95	163	90
Lawrence.....	8,630	90	7,767	93	26	"	11	90	10	100
Licking.....	34,674	94	32,594	80	22	"	23	100	23	100
Logan.....	25,501	95	24,226	96	21	"	124	100	124	80
Lorain.....	16,609	93	15,446	95	23	"	366	100	366	95
Lucas.....	16,552	98	16,221	93	20	"	547	100	547	94
Madison.....	25,762	88	22,671	85	39	"	11	100	11	100
Mahoning.....	12,033	101	12,153	95	17	"	31	100	31	95
Marion.....	24,415	95	23,194	91	19	"	62	100	62	91
Medina.....	19,087	94	17,942	90	23	"	32	100	32	90
Meigs.....	12,916	97	12,529	75	28	"	48	100	48	75
Mercer.....	39,666	90	35,699	80	18	Bad.	493	96	473	89
Miami.....	40,283	99	39,880	100	20	Good.	458	98	449	94
Monroe.....	20,086	96	19,283	100	20	"	2	100	2	100
Montgomery.....	37,084	100	37,084	100	18	"	545	100	545	100
Morgan.....	9,208	90	9,184	95	25	"				

AGRICULTURAL REPORT

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Wheat.						Barley.			
	Area sown last fall.	Area sown this fall, compared with last year.	Estimated area seeded for the harvest of 1897.	Condition compared with an average.	Wheat sown, days after September 1.	Condition of soil at time of seeding.	Area sown last fall.	Area sown this fall compared with last year.	Estimated area seeded for the harvest of 1897.	Condition compared with an average.
	Acres.	Per cent	Acres.	Per cent			Acres.	Per cent	Acres.	Per cent
Morrow	15,580	93	14,489	96	13	Good.	16	100	16	96
Muskingum	21,454	100	21,454	97	22	"	25	100	25	100
Noble	14,480	95	13,766	96	20	"	.....	.....	.....	.....
Ottawa	15,766	103	16,239	102	17	"	1,539	100	1,539	100
Paulding	16,080	98	15,758	99	27	"	31	100	31	100
Perry	13,408	98	13,140	100	26	"	8	100	8	100
Pickaway	50,836	90	45,592	90	28	Bad.	10	100	10	90
Pike	14,359	95	13,641	98	35	Good.	136	100	136	98
Portage	19,857	98	19,460	93	19	"	91	100	91	93
Preble	40,556	100	40,556	90	23	"	187	90	168	95
Putnam	31,363	92	28,854	90	20	"	81	100	81	91
Richland	41,588	92	38,261	90	23	"	199	90	179	100
Ross	37,575	100	37,575	94	28	"	23	100	23	95
Sandusky	33,867	95	32,174	90	25	"	328	100	328	90
Scioto	12,788	100	12,788	90	15	"	22	100	22	95
Seneca	50,566	96	48,543	94	15	"	62	100	62	95
Shelby	34,265	95	32,552	90	25	"	524	95	498	90
Stark	38,788	95	36,849	92	16	"	75	95	71	93

	23,650	95	22,468	90	16	Fair.	18	100	18	92
Summit.....	10,718	93	9,988	97	19	Good.	18	100	18	96
Trumbull.....	26,868	100	26,868	95	19	"	37	100	37	90
Tuscarawas.....	22,138	98	21,695	97	20	"	5	100	5	100
Union.....	29,224	96	28,055	90	15	Fair.	180	100	180	95
Van Wert.....	7,040	95	6,688	98	29	Good.	2	100	2	100
Vinton.....	35,607	97	34,539	87	30	"	510	95	485	95
Warren.....	28,571	102	29,142	101	34	"	5	100	5	100
Washington.....	44,649	97	43,310	99	21	"	48	100	48	95
Wayne.....	30,683	102	31,297	100	25	"	108	100	108	100
Williams.....	49,102	97	47,629	95	19	"	606	100	606	100
Wood.....	21,576	95	20,497	102	19	"	28	100	28	101
Wyandot.....										
Average per cent.....	.....	96	.....	93	Sept. 23	.....	.....	97	.....	94
Totals.....	2,251,043	.....	2,161,295	.....	.....	.....	14,400	.....	13,925	.....

AGRICULTURAL REPORT.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC.—Continued.

Counties.	Rye.		Corn.	Buck- wheat.	Clover seed.	Potatoes.				Apples.	Hogs.		C. F.
	Area sown last fall.	Area sown this fall, com- pared with last year.				Estimated area planted.	Average product per acre.	Total estimated product for 1896.	Affected by rot.		Condition compared with an average.	Number to be fattened compared with last year.	
	Acres.	Per ct.	Acres.	Per ct.	Per ct.	Acres.	Bush.	Bushels	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
Adams.....	252	90	227	106	57	234	145	3,930	5	19	97	86	76
Allen.....	343	90	309	95	48	942	91	85,722	11	95	76	75	10
Ashland.....	145	90	130	92	80	1,204	110	132,440	2	96	74	94	51
Ashtabula.....	394	90	355	96	83	3,188	99	315,612	4	125	100	97	74
Athens.....	43	100	43	98	90	1,025	128	131,200	2	23	100	100	89
Auglaize.....	340	90	306	101	52	1,153	89	102,617	10	64	85	81	4
Belmont.....	146	100	146	96	83	1,723	60	103,380	15	33	99	88	22
Brown.....	964	100	964	98	.....	990	113	111,870	12	20	97	75	53
Butler.....	383	100	383	110	45	1,737	104	180,648	12	10	97	79	63
Carroll.....	196	93	182	89	35	567	108	61,136	4	110	96	88	2
Champaign.....	351	95	333	103	26	1,135	108	122,580	19	10	96	88	6
Clark.....	892	95	827	103	26	1,542	108	166,536	19	10	100	98	22
Clermont.....	918	100	918	102	77	1,742	70	121,940	6	20	100	98	13
Clenton.....	151	100	151	108	50	3,237	66	213,642	5	18	87	69	53
Columbiana.....	243	98	238	99	59	1,804	100	180,400	4	130	100	93	32
Coshocton.....	207	100	207	87	69	1,240	94	116,560	8	78	98	93	37
Crawford.....	173	100	173	90	18	1,177	55	64,735	2	97	93	75	37
Cuyahoga.....	580	100	580	88	5,846	92	537,832	10	115	100	100	72

CROP AND LIVE STOCK STATISTICS.

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Darke.....	849	90	764	107	74	28	2,523	81	202,363	8	16	96	86	12
Defiance.....	364	90	328	102	67	39	1,043	78	81,354	15	64	85	73	1
Delaware.....	186	90	167	102	95	27	947	66	62,502	10	103	90	81	22
Erie.....	506	96	486	100	97	72	2,897	95	255,215	2	110	100	97	16
Fairfield.....	131	90	118	87	82	37	1,612	66	105,392	10	15	86	70	48
Fayette.....	290	100	290	110	.....	110	41	37	7,363	11	18	73	86	31
Franklin.....	86	100	86	107	91	25	3,735	70	261,450	18	55	94	73	9
Fulton.....	697	90	627	110	74	63	1,400	95	233,000	14	120	94	88	3
Gallia.....	75	100	75	100	.....	75	556	130	72,280	10	15	75	80	70
Geauga.....	72	100	72	102	99	81	2,035	107	217,745	6	120	100	84	75
Greene.....	455	95	432	110	90	39	1,002	114	114,228	7	11	98	76	4
Guernsey.....	372	100	372	95	80	50	595	105	62,475	1	20	100	97	75
Hamilton.....	806	105	846	115	.....	100	5,498	133	731,234	4	13	92	125	12
Hancock.....	910	93	846	101	100	51	1,391	63	87,633	12	33	89	92	6
Hardin.....	552	90	497	104	80	37	2,734	72	196,848	10	90	94	91	1
Harrison.....	60	100	60	99	90	98	384	97	37,248	7	88	96	88	46
Henry.....	3,442	90	3,098	99	65	42	1,221	75	91,575	3	73	94	92	1
Highland.....	268	90	241	98	80	52	337	94	31,678	6	15	84	70	61
Hocking.....	78	100	78	105	100	60	761	120	91,326	2	15	100	100	90
Holmes.....	492	103	507	101	100	45	944	67	63,248	11	92	100	92	22
Huron.....	202	90	182	96	97	58	1,498	73	109,354	7	115	100	90	59
Jackson.....	.....	.....	.....	92	100	75	174	82	14,268	15	40	96	67	85
Jefferson.....	36	100	36	105	100	49	1,996	88	175,648	6	70	104	90	48
Knox.....	340	90	306	104	100	54	781	85	66,385	5	89	100	82	38
Lake.....	517	92	477	90	.....	.....	831	96	79,776	3	125	97	100	43
Lawrence.....	132	95	125	105	100	88	466	120	55,920	7	20	92	87	32
Licking.....	347	97	337	104	89	52	1,522	101	163,822	9	82	98	89	35
Logan.....	330	95	313	102	89	40	767	79	60,593	9	55	93	83	10
Lorain.....	207	100	207	95	90	66	1,708	80	136,640	10	115	95	91	58
Lucas.....	1,398	95	1,328	112	92	42	3,438	110	378,180	5	114	100	96	5
Madison.....	393	90	354	102	75	40	436	86	37,496	8	45	80	69	0
Mahoning.....	327	100	327	98	75	77	3,220	90	289,800	3	120	97	100	72
Marion.....	221	96	208	91	89	45	1,308	81	105,948	10	105	87	68	3
Medina.....	52	96	50	105	100	62	1,711	114	195,054	7	110	100	98	84
Meigs.....	746	95	32	95	82	60	1,338	97	129,786	6	25	99	84	89
Mercer.....	709	106	709	106	75	37	867	90	78,030	7	95	97	87	2
Miami.....	198	90	178	107	90	40	2,167	135	292,545	14	15	98	98	14
Monroe.....	238	95	226	105	85	90	1,304	78	101,712	7	58	100	87	70
Montgomery.....	464	100	464	105	.....	40	1,757	80	140,560	6	20	100	100	20
Morgan.....	82	100	82	94	58	56	711	115	81,765	2	16	100	77	64

AGRICULTURAL REPORT.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE, ETC. Concluded.

Counties.	Rye.		Corn.	Buck-wheat.	Clover seed.	Potatoes.				Apples.	Hogs.		C. F.
	Area sown this fall, compared with last year.	Estimated area seeded for the harvest of 1897.	Prospect compared with an average.	Prospect compared with an average.	Prospect compared with an average.	Estimated area planted.	Average product per acre.	Total estimated product for 1896.	Affected by rot.	Product compared with an average.	Condition compared with an average.	Number to be fattened compared with last year.	
	<i>Acres.</i>	<i>Acres.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Acres.</i>	<i>Bush.</i>	<i>Bushels.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>
Morrow	638	98	99	81	29	1,445	82	128,490	10	100	98	89	48
Muskingum.....	1,411	98	94	100	59	1,534	91	139,594	8	66	102	89	78
Noble	69	100	97	94	77	757	86	65,102	10	35	90	83	30
Ottawa.....	388	98	110	100	73	684	65	44,360	10	105	100	87	1
Paulding.....	830	95	102	100	48	678	67	45,426	20	49	84	85	0
Perry.....	156	95	105	.....	52	759	102	77,418	20	25	100	88	70
Pickaway.....	130	95	108	.....	21	1,042	63	65,646	5	12	73	55	8
Pike	2	10	100	87	58	500	140	70,000	15	32	100	90	52
Portage.....	167	95	92	96	41	3,151	126	397,026	4	125	100	98	67
Preble.....	307	105	115	.....	63	699	95	66,405	4	27	81	79	68
Putnam.....	1,049	91	96	65	36	3,164	91	287,924	2	86	94	89	0
Richland.....	559	100	95	80	45	1,822	90	162,980	8	117	97	92	90
Ross.....	193	102	112	92	46	1,674	90	150,660	1	31	70	77	38
Sandusky	617	100	94	77	60	2,126	60	127,560	2	60	80	80	5
Scioto.....	80	100	90	.....	40	1,070	75	80,250	1	70	100	100	80
Seneca.....	433	95	98	67	38	1,879	73	137,167	7	88	98	90	39
Shelby.....	300	96	102	85	30	953	90	85,770	7	25	100	62	9
Stark	196	100	92	62	35	2,607	116	302,412	1	84	91	88	37

ACREAGE AND PRODUCT OF CORN AND CONDITION OF OTHER CROPS, DEC. 1, 1896.

The following report is based on returns from the regular township crop correspondents of the Board, compiled for each county and for the state :

WHEAT—condition compared with an average.....	94 per cent
“ —crop of 1896 sold as soon as threshed.....	42 “
“ —damage to growing crop by Hessian fly.....	3 “
“ —damage to growing crop by white grub worm.....	1 “
CORN—estimated area planted.....	2,904,815 acres
“ —estimated average yield per acre.....	41 bushels
“ —total estimated product.....	119,547,107 bushels
“ —cut up for fodder.....	86 per cent
“ —put into silo.....	1 “
“ —average date of cutting for fodder,	September 15
“ —average date cribbing began.....	October 15
CLOVER SEED—probable total yield compared with average	47 per cent
APPLES—probable yield compared with an average.....	63 “
POTATOES—estimated average yield per acre.....	86 bushels
TOBACCO—estimated average yield per acre.....	768 pounds
CATTLE—number being fed for spring market, compared with last year	78 per cent
SHEEP—number being fed for mutton, compared with last year.....	72 “

The average condition of the growing wheat is fairly good. The plant has not attained such large growth, but generally speaking, it is healthy and of sufficient root vigor to go into winter. The exception may be some that has been damaged by Hessian fly, which has been quite prevalent and particularly in that which was sown early. No one can foretell the effects of winter, but with ample snow protection, present condition seems to indicate that the wheat ought to come out well in the spring.

The corn area and product is above an average. This is the first report of the year estimating the corn product in bushels. The result is a total of 119,547,107 bushels as against 96,263,789 bushels last year. The basis of calculation is in bushels of shelled corn. The general estimate is no doubt too high rather than too low, as a great many correspondents in the northeastern portion of the state return bushels of ears, but where this was discovered the figures were reduced to represent shelled corn, so that on the whole, the estimate cannot be a great deal too high. There have been many unusually large yields of corn on good lands, well cultivated, while on some of the river bottoms considerable damage and loss was sustained by reason of the overflows and washouts during August. Much of the crop was slow in curing and as a consequence there has been considerable moldy and unmerchantable corn.

Owing to the fear of cholera, which has been more generally preva-

lent than usual, many feeders of hogs shipped out their bunches before being properly fattened. Stock hogs are scarce.

Potatoes were a good average in production, but have been affected by rot. Pastures have held out well.

There is a tendency among farmers to replenish their sheep and there is now some demand for good ewes.

Winter has apparently set in, but as a rule crops have been well gathered and secured.

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON
THE CONDITION OF CROPS, DECEMBER 1, 1896.

Counties.	Wheat.			
	Condition compared with an average.	Crop of 1896 sold as soon as threshed.	Damage to growing crop by Hessian fly.	Damage to growing crop by white grub worm.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Adams.....	94	42	2	0
Allen.....	90	52	6	2
Ashland.....	90	36	10	2
Ashtabula.....	89	18	5	1
Athens.....	100	30	2	0
Auglaize.....	89	53	10	0
Belmont.....	101	21	1	0
Brown.....	100	50	0	0
Butler.....	101	29	2	0
Carroll.....	88	14	9	4
Champaign.....	100	80	14	0
Clark.....	96	49	3	0
Clermont.....	100	59	5	0
Clinton.....	98	58	5	6
Columbiana.....	94	17	7	0
Coshocton.....	92	51	4	0
Crawford.....	90	50	1	0
Cuyahoga.....	89	27	2	1
Darke.....	93	66	5	1
Defiance.....	93	53	3	0
Delaware.....	85	44	2	0
Erie.....	96	61	4	1
Fairfield.....	94	43	2	0
Fayette.....	101	67	1	0
Franklin.....	94	50	1	0
Fulton.....	90	32	3	0
Gallia.....	100	30	3	0
Geauga.....	91	15	4	2
Greene.....	86	50	2	0
Guernsey.....	99	27	1	0
Hamilton.....	102	42	2	0
Hancock.....	93	35	3	0
Hardin.....	90	66	1	0
Harrison.....	100	20	0	0
Henry.....	102	50	6	1
Highland.....	91	54	2	0
Hocking.....	95	35	0	0
Holmes.....	86	25	1	0
Huron.....	92	41	2	0
Jackson.....	90	30	5	0
Jefferson.....	101	20	5	0
Knox.....	91	29	0	0
Lake.....	89	28	0	0
Lawrence.....	97	45	0	0
Licking.....	93	28	1	0
Logan.....	88	57	6	1
Lorain.....	92	39	3	1
Lucas.....	95	60	1	0
Madison.....	99	80	1	0
Mahoning.....	91	42	4	0
Marion.....	101	80	0	0
Medina.....	87	19	4	1
Meigs.....	100	23	1	0
Mercer.....	89	70	2	0
Miami.....	89	57	10	3
Monroe.....	101	54	3	4
Montgomery.....	95	37	5	0
Morgan.....	100	37	1	1
Morrow.....	94	22	5	0
Muskingum.....	101	36	0	2
Noble.....	101	10	1	1
Ottawa.....	100	25	0	0
Paulding.....	100	50	0	0
Perry.....	97	24	0	3
Pickaway.....	94	62	0	1

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CON-
DITION OF CROPS, DECEMBER 1, 1896—Continued.

Counties.	Wheat.			
	Condition compared with an average.	Crop of 1896 sold as soon as threshed.	Damage to growing crop by Hessian fly.	Damage to growing crop by white grub worm.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Pike.....	90	37	4	0
Portage.....	86	40	10	0
Preble.....	95	60	8	3
Putnam.....	90	70	1	0
Richland.....	85	41	8	4
Ross.....	100	53	4	1
Sandusky.....	91	30	4	3
Scioto.....	96	60	0	2
Seneca.....	90	29	8	0
Shelby.....	90	60	4	0
Stark.....	89	41	10	2
Summit.....	88	36	10	1
Trumbull.....	94	22	5	2
Tuscarawas.....	93	35	5	2
Union.....	111	60	1	2
Van Wert.....	91	52	1	0
Vinton.....	96	38	1	0
Warren.....	94	28	4	0
Washington.....	100	39	3	2
Wayne.....	89	43	10	0
Williams.....	100	20	5	0
Wood.....	98	50	2	0
Wyandot.....	101	50	5	0
Totals.....				
Average per cent.....	94	42	3	1

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CONDITION OF CROPS, DECEMBER 1, 1896—Continued.

Counties.	Corn.						
	Area planted.	Estimated average yield per acre.	Total estimated product.	Cut up for fodder.	Put into silo.	Date of cutting for fodder, days after Sept. 1.	Date cribbing begun, days after Oct. 1.
	<i>Acres.</i>	<i>Bushels</i>	<i>Bushels.</i>	<i>Per cent.</i>	<i>Per cent.</i>		
Adams.....	32,946	36	1,186,056	93	1	17	23
Allen.....	33,393	40	1,335,720	94	1	14	17
Ashland.....	25,665	38	975,270	96	2	20	14
Ashtabula.....	9,326	40	373,040	73	5	21	17
Athens.....	16,976	42	712,992	95	5	10	11
Auglaize.....	36,424	41	1,493,384	93	0	3	8
Belmont.....	27,062	38	1,028,356	95	4	14	14
Brown.....	45,874	30	1,376,220	60	0	15	30
Butler.....	60,370	42	2,535,540	40	0	17	25
Carroll.....	14,249	39	555,711	90	0	19	16
Champaign.....	56,066	45	2,522,970	90	0	22	20
Clark.....	50,546	43	2,173,478	88	1	17	13
Clermont.....	35,372	40	1,414,880	85	3	19	27
Clinton.....	53,667	44	2,361,348	75	1	24	17
Columbiana.....	18,298	43	768,814	96	3	21	16
Coshocton.....	24,187	40	967,480	98	0	15	22
Crawford.....	35,419	41	1,452,179	80	0	22	20
Cuyahoga.....	10,074	41	413,034	47	8	16	15
Darke.....	77,285	39	3,014,115	60	0	12	10
Defiance.....	23,790	42	999,180	90	0	13	10
Delaware.....	35,340	41	1,448,940	93	2	10	11
Erie.....	17,208	43	739,944	92	4	11	14
Fairfield.....	49,304	43	2,120,072	70	6	18	15
Fayette.....	55,779	44	2,454,276	85	0	13	23
Franklin.....	63,781	40	2,551,240	90	1	12	14
Fulton.....	27,004	44	1,188,176	91	1	3	5
Gallia.....	23,110	34	785,740	90	0	25	15
Geauga.....	8,016	43	344,668	76	3	16	10
Greene.....	60,049	44	2,642,156	86	1	11	14
Guernsey.....	1,722	39	67,158	98	2	13	9
Hamilton.....	16,560	40	662,400	69	0	11	18
Hancock.....	51,257	40	2,050,280	82	0	13	12
Hardin.....	36,343	42	1,526,406	90	0	12	16
Harrison.....	14,361	45	646,245	90	4	17	15
Henry.....	41,753	38	1,586,614	92	0	5	11
Highland.....	47,448	35	1,730,680	85	0	11	21
Hocking.....	14,709	35	514,815	90	0	25	10
Holmes.....	23,815	32	762,080	95	0	22	17
Huron.....	26,561	40	1,062,440	68	5	15	12
Jackson.....	12,752	38	474,576	95	0	17	13
Jefferson.....	13,731	41	562,971	96	1	17	14
Knox.....	31,758	42	1,333,836	95	1	18	14
Lake.....	3,144	40	125,760	96	15	26	22
Lawrence.....	21,326	37	789,062	92	1	16	30
Licking.....	51,901	41	2,127,941	96	1	13	12
Logan.....	38,950	46	1,791,700	89	1	14	11
Lorain.....	13,610	42	571,620	78	3	16	18
Lucas.....	18,297	39	713,583	92	0	11	11
Madison.....	82,796	45	3,725,820	76	2	12	20
Mahoning.....	16,913	41	694,663	99	1	16	13
Marion.....	38,718	42	1,626,156	88	0	15	17
Medina.....	19,537	38	742,406	98	1	13	10
Meigs.....	16,554	39	645,606	100	0	13	17
Mercer.....	51,365	40	2,054,400	97	0	18	9
Miami.....	50,534	43	2,172,962	75	2	10	13
Monroe.....	16,836	29	488,244	90	2	7	17
Montgomery.....	49,151	45	2,211,795	90	0	12	15
Morgan.....	16,857	37	623,709	98	0	16	19
Morrow.....	25,325	38	962,350	96	0	11	4
Muskingum.....	29,135	37	1,077,995	85	2	17	18
Noble.....	16,793	32	537,376	96	0	11	11
Ottawa.....	15,603	40	624,120	50	0	10	30
Paulding.....	29,649	44	1,304,556	88	0	1	17
Perry.....	33,235	40	1,329,400	100	0	13	1
Pickaway.....	74,111	46	3,409,106	93	1	10	6
Pike.....	19,311	40	772,440	82	0	8	22
Portage.....	15,173	39	591,747	86	4	18	17
Preble.....	51,460	44	2,264,240	56	3	20	23
Putnam.....	50,678	45	2,280,510	88	2	6	14
Richland.....	28,672	47	1,347,584	94	3	16	20
Ross.....	66,349	47	3,118,403	74	0	14	18

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CON-
DITION OF CROPS, DECEMBER 1, 1896—Continued.

Counties.	Corn.						
	Area planted.	Estimated aver- age, yield per acre.	Total estimated product.	Cut up for fod- der.	Put into silo.	Date of cutting for fodder, days after Sept. 1.	Date cribbing began, days after Oct. 1.
	Acres.	Bushels.	Bushels.	Per cent.	Per cent.		
Sandusky	35,080	42	1 473,360	89	1	9	7
Scioto	20,178	41	827,298	73	0	23	21
Seneca	43,550	45	1 959,750	87	0	13	9
Shelby	41,394	41	1,697,154	84	0	18	15
Summit	28,174	45	1,267,830	97	0	18	12
Trumbull	17,045	42	715,890	80	4	19	15
Tuscarawas	13,008	39	507,312	74	2	14	16
Union	21,634	35	757,190	100	1	13	18
Van Wert	57,596	37	2 123,652	85	1	11	17
Vinton	43,974	40	1,758,960	93	0	7	12
Warren	13,009	33	429,297	99	0	15	16
Washington	58,993	43	2,516,699	85	0	19	20
Wayne	23,313	41	955,833	95	0	13	17
Williams	36,565	40	1,462,600	90	1	16	11
Wood	25,153	40	1,006,120	100	0	15	5
Wyandot	73,150	42	3,072,300	56	1	15	10
	31,556	43	1 356,908	73	0	15	9
Totals	9,204,815	41	119,547,107	.....	.....	Sept.	Oct.
Average per cent.				86	1	15	15

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CON-
DITION OF CROPS, DECEMBER 1, 1896—Continued.

Counties.	Clover seed.	Apples.	Potatoes.	Tobacco.	Cattle.	Sheep.
	Probable total yield.	Probable total crop com- pared with average.	Average yield per acre.	Estimated product per acre.	Number being fed for spring market, com- pared with last year.	Number being fed for mut- ton compared with last year
	Per cent.	Per cent.	Busheis.	Per cent.	Per cent.	Per cent.
Adams.....	47	24	125	800	90	85
Allen.....	38	90	84	0	78	68
Ashland.....	45	101	90	0	89	77
Ashtabula.....	78	125	83	0	78	57
Athens.....	50	23	90	0	75	62
Auglaize.....	20	30	95	0	79	30
Belmont.....	67	71	63	800	82	94
Brown.....	75	35	50	750	75	75
Butler.....	45	10	90	850	99	90
Carroll.....	40	108	80	0	57	66
Champaign.....	0	60	65	0	72	78
Clark.....	30	23	74	0	74	77
Clermont.....	65	23	72	895	92	105
Clinton.....	43	26	59	650	63	64
Columbiana.....	46	100	92	0	83	70
Coshocton.....	47	84	94	0	70	66
Crawford.....	40	80	96	0	50	80
Cuyahoga.....	0	105	86	0	68	53
Darke.....	32	15	100	790	83	70
Defiance.....	36	61	78	0	91	81
Delaware.....	41	97	63	0	64	58
Erie.....	65	100	83	0	93	94
Fairfield.....	20	18	100	0	74	95
Fayette.....	36	18	55	0	86	49
Franklin.....	32	60	85	0	71	50
Fulton.....	39	105	79	0	100	97
Gallia.....	75	15	110	0	80	75
Geauga.....	79	110	105	0	80	50
Greene.....	30	15	75	0	75	75
Guernsey.....	57	54	79	0	50	43
Hamilton.....	75	9	107	0	100	100
Hancock.....	38	60	88	0	95	97
Hardin.....	23	100	71	0	50	50
Harrison.....	68	95	95	0	100	55
Henry.....	40	95	65	0	100	100
Highland.....	35	14	82	700	93	71
Hocking.....	0	50	100	0	95	50
Holmes.....	31	90	79	600	79	67
Huron.....	36	100	72	0	84	71
Jackson.....	0	25	95	0	40	30
Jefferson.....	70	105	93	0	100	100
Knox.....	40	103	96	0	82	75
Lake.....	30	110	92	0	55	27
Lawrence.....	70	15	110	0	82	65
Licking.....	36	80	88	0	88	77
Logan.....	21	54	77	0	76	61
Lorain.....	51	105	77	0	69	74
Lucas.....	50	110	84	0	75	90
Madison.....	37	33	83	0	54	57
Mahoning.....	66	110	96	0	72	92
Marion.....	75	105	60	0	100	80
Medina.....	28	104	100	800	80	82
Meigs.....	77	10	110	0	68	30
Mercer.....	25	101	103	0	63	60
Miami.....	15	19	94	838	72	72
Monroe.....	80	27	76	850	57	75
Montgomery.....	12	10	80	900	100	50
Morgan.....	39	16	66	600	61	70
Morrow.....	30	100	80	0	99	90
Muskingum.....	66	61	90	600	80	68
Noble.....	66	36	80	850	81	72
Ottawa.....	50	100	40	0	100	75
Paulding.....	40	74	76	0	88	68
Perry.....	54	15	110	0	75	71
Pickaway.....	18	14	96	0	69	57
Pike.....	50	30	92	0	75	70
Portage.....	62	104	103	0	78	74
Preble.....	36	32	87	750	87	100
Putnam.....	42	80	82	0	81	78
Richland.....	32	101	84	0	85	70
Ross.....	29	28	83	0	91	73
Sandusky.....	53	91	59	0	81	67

OFFICIAL REPORT OF THE OHIO DEPARTMENT OF AGRICULTURE ON THE CON-
DITION OF CROPS, DECEMBER 1, 1896—Concluded.

Counties.	Clover seed.	Apples.	Potatoes.	Tobacco.	Cattle.	Sheep.
	Probable total yield.	Probable total crop, com- pared with average.	Average yield per acre.	Estimated prod- uct per acre.	Number being fed for spring market, com- pared with last year.	Number being fed for mut- ton com- pared with last year.
	Per cent.	Per cent.	Bushels.	Per cent.	Per cent.	Per cent.
Scioto.....	25	30	65	0	83	80
Seneca.....	36	81	59	0	75	72
Shelby.....	17	18	95	0	62	55
Stark.....	38	81	105	0	65	68
Summit.....	86	93	107	0	86	77
Trembull.....	55	105	106	0	64	56
Tuscarawas.....	68	86	94	0	84	61
Union.....	36	100	81	0	85	89
Van Wert.....	80	85	73	0	82	82
Vinton.....	50	15	102	0	100	90
Warren.....	53	16	90	0	100	93
Washington.....	30	12	100	800	75	65
Wayne.....	61	90	97	0	80	83
Williams.....	75	90	100	0	80	90
Wood.....	59	75	92	0	86	79
Wyandot.....	56	100	83	0	91	88
Total.....						
Average per cent.....	47	83	86	768	78	72

TABLE SHOWING THE ANNUAL PRODUCTION AND PRICE OF WHEAT AND CORN FOR THE YEARS 1850 TO 1896,
INCLUSIVE.

Year.	Bushels of wheat.	Average number of bushels per acre.	Price.		Bushels of corn.	Average number of bushels per acre.	Price.	
			Range.	Average.			Range.	Average.
1850.....	31,500,000	18.	\$0.70 to \$1.10	.89	56,619,608	36.8	\$0.24 to \$0.51	.38
1851.....	25,309,225	15.2	.58 " .78	.69	61,271,382	36.7	.30 " .94	.38
1852.....	23,043,737	14.1	.59 " .63	.60	58,165,517	33.6	.25 " .45	.39
1853.....	17,118,311	8.	.60 " .85	.73	73,436,070	40.	.37 " .55	.42
1854.....	11,969,110	8.	.85 " 1.70	1.19	52,171,551	26.	.40 " .80	.49
1855.....	19,569,320	13.81	1.10 " 2.00	1.54	87,587,434	39.7	.55 " .63	.67
1856.....	15,333,837	10.2	.90 " 1.70	1.27	57,802,515	27.7	.32 " .42	.42
1857.....	25,397,014	14.	1.00 " 1.60	1.18	82,555,186	36.6	.48 " .80	.59
1858.....	17,655,483	10.4	.67 " 1.00	.77	50,863,582	27.7	.25 " .61	.42
1859.....	13,317,967	7.2	.90 " 1.70	1.15	68,730,846	29.5	.50 " .90	.72
1860.....	23,040,356	13.8	.93 " 1.38	1.17	91,588,704	38.2	.39 " .80	.50
1861.....	20,055,424	11.	.65 " 1.12	.93	74,858,878	33.5	.28 " .50	.34
1862.....	20,764,887	12.	.72 " 1.00	.86	62,704,887	30.	.27 " .40	.31
1863.....	20,452,410	11.36	.82 " 1.30	1.04	54,614,617	27.	.35 " .70	.53
1864.....	15,541,585	9.33	.95 " 2.12	1.78	54,053,491	27.	.63 " 1.27	1.03
1865.....	13,234,139	9.	1.25 " 2.80	2.27	68,053,698	35.	.56 " 1.29	.77
1866.....	5,821,747	4.5	1.75 " 3.50	2.79	80,386,320	36.5	.45 " .65	.54
1867.....	13,350,721	11.51	.95 " 2.65	2.31	63,875,064	29.8	.59 " .98	.79
1868.....	16,480,059	11.31	1.90 " 2.12	2.01	76,725,288	34.4	.82 " 1.08	.92
1869.....	26,499,729	15.37	1.15 " 1.98	1.57	62,443,346	28.4	.57 " 1.10	.73
1870.....	18,726,341	11.29	1.08 " 1.33	1.15	88,505,299	37.5	.69 " 1.05	.83
1871.....	22,274,378	13.27	1.10 " 1.55	1.27	98,363,060	36.7	.50 " .79	.56
1872.....	18,987,664	11.22	1.13 " 2.08	1.58	103,068,234	40.9	.44 " .57	.49
1873.....	21,974,385	12.61	1.30 " 1.80	1.56	103,068,234	35.1	.39 " .50	.42
1874.....	26,806,818	14.51	1.03 " 1.60	1.38	84,049,328	39.8	.42 " .75	.60
1875.....	17,867,967	9.22	1.03 " 1.75	1.16	101,815,494	34.1	.58 " .87	.72
1876.....	15,354,569	10.18	1.00 " 1.50	1.10	97,825,024	36.8	.40 " .73	.51
1877.....	27,306,566	15.63	1.08 " 2.15	1.41	112,552,642	32.5	.40 " .57	.46
1878.....	35,218,783	16.58	.85 " 1.85	1.11	101,884,305	37.8	.38 " .49	.42
1879.....	41,052,120	17.78	.85 " 1.15	.96	114,839,107	34.	.31 " .45	.37
1880.....	48,540,307	17.20	.93 " 1.37	1.16	96,908,800	38.9	.42 " .51	.42
1881.....	38,102,632	13.8	.88 " 1.39	1.10	105,414,504	31.	.40 " .87	.49
1882.....	42,112,103	15.59	.95 " 1.50	1.32	78,712,796	34.	.56 " .76	.72
1883.....	27,169,738	10.67	.95 " 1.17	1.05	90,869,137	31.	.41 " .62	.54
1884.....	36,396,119	14.4	.80 " 1.10	1.01	64,001,618	33.3	.40 " .62	.53
1885.....	24,183,430	9.8	.72 " 1.09	.89	87,737,813	39.	.37 " .58	.47
1886.....	37,660,081	14.	.74 " 1.00	.80	112,192,744	33.5	.32 " .48	.39
1887.....	28,400,000	10.4	.71 " .89	.80	88,818,556	30.5	.34 " .55	.40
1888.....	26,160,594	11.7	.71 " .96	.85	83,118,838	38.9	.44 " .61	.52

1889	31,663,448	14.6	.73 "	1.15	.93	87,838,192	32.3	.30 "	.49	.37
1890	31,509,676	13.8	.75 "	1.02	.83	63,694,215	24.5	.27 "	.56	.36
1891	45,063,480	17.5	.82 "	1.16	.99	86,500,000	33.	.49 "	.77	.60
1892	40,254,621	14.4	.73 "	1.01	.90	80,802,958	30.8	.39 "	.67	.48
1893	46,545,258	17.2	.52 "	.93	.64	67,681,125	25.	.37 "	.45	.42
1894	50,852,433	20.	.48 "	.56	.51	70,712,925	25.	.35 "	.59	.45
1895	26,520,630	11.9	.53 "	.90	.66	96,263,789	33.9	.24 "	.56	.41
1896	17,289,545	8.53	.56 "	.97	.72	119,547,107	41.	.18 "	.33	.27

NOTE—Prices here given relate to the commercial year ending September 1.

AVERAGE PRICES OF OTHER FARM PRODUCTS IN THE LOCAL MARKETS OF OHIO FROM 1855 TO 1896, INCLUSIVE.

Year.	Barley.	Oats.	Rye.	Hay.	Potatoes.
1855.....	\$1 35	\$0 29½	70	\$14 71	.....
1856.....	1 58	46	91	21 00	.....
1857.....	58	36	58	13 46	.....
1858.....	67	57	82	15 38	.....
1859.....	76	43	86	17 73	.....
1860.....	69	27	56	12 62	.....
1861.....	60	30	48	11 85	.....
1862.....	1 36	58	76	16 34	.....
1863.....	1 51	78½	1 35	27 16	.....
1864.....	1 28	52	1 15	26 00	.....
1865.....	1 41	42	80	12 63	.....
1866.....	1 53	57	1 28	19 76	.....
1867.....	2 11	69	1 62	14 80	.....
1868.....	2 37	64	1 28	16 42	.....
1869.....	1 26	54	92	17 44	.....
1870.....	1 00	46	91	18 45	.....
1871.....	78	37	85	20 79	.....
1872.....	87	36	76	22 18	.....
1873.....	1 51	48	93	17 16	.....
1874.....	1 41	59	1 06	20 98	.....
1875.....	1 20	38	74	17 66	.....
1876.....	90	37	74	11 67	\$2 82
1877.....	52	29	59	9 86	1 44
1878.....	1 00	27	54	10 79	1 83
1879.....	89	34	82	15 87	1 16
1880.....	98	38	1 04	16 36	2 18
1881.....	1 05	50	94	17 90	3 30
1882.....	76	39	62	12 39	2 09
1883.....	76	34	62	11 63	1 47
1884.....	80	32	63	12 81	1 50
1885.....	86	30	63	12 16	1 54
1886.....	61	29	58	11 17	1 69
1887.....	81	33	62	14 79	2 74
1888.....	78	26	52	12 74	1 30
1889.....	57	27	50	10 56	1 67
1890.....	77	48	81	10 58	2 99
1891.....	70	33	85	11 25	1 45
1892.....	69	33	73	11 10	1 75
1893.....	64	32	55	12 55	2 30
1894.....	60	35	52	10 95	2 08
1895.....	56½	27	53	12 70	1 56
1896.....	34	20	36	12 83	85
Average.....	\$0 98½	\$0 40	\$0 80½	\$15 17	\$1 89½

Barley, Oats and Rye are rated per bushel; Hay rated per ton; Potatoes rated per barrel.

TABLE SHOWING THE AVERAGE PRODUCTION AND PRICE OF WHEAT AND CORN BY DECADES.

Decades.	Average bushels of wheat.	Average bushels per acre.	Range of price.	Average price.	Average bushels of corn.	Average bushels per acre.	Range of price.	Average price.
1850 to 1860.....	20,023,460	12.29	\$0 58 to \$2 00	\$1 90	64,920,369	33.4	\$0 24 to \$0 90	\$0 48
1860 to 1870.....	17,584,085	10.91	60 to 3 50	1 61	68,930,126	32.	27 to 1 29	64
1870 to 1880.....	24,656,959	13.29	88 to 2 15	1 27	99,986,129	36.5	38 to 1 05	54
1880 to 1890.....	34,038,945	13.21	71 to 1 50	1 00	90,991,979	33.5	30 to 87	45
Last ten years, 1887 to 1896, inclusive.....	34,427,038	14.	48 to 1 16	78	86,731,465	31.5	18 to 77	42

AGRICULTURAL REPORT.

TABULAR STATEMENT

EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC., SHEEP AND HOGS RETURNED TO THE AUDITOR OF STATE'S OFFICE BY THE SEVERAL COUNTY AUDITORS FOR THE YEARS 1895 AND 1896.

Counties.	Number of horses.		Number of cattle.		Number of mules.		Number of sheep.		Number of hogs.	
	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.
Adams.....	5,011	4,927	8,575	8,354	218	228	11,420	8,533	10,591	11,600
Allan.....	9,193	9,174	12,779	12,151	139	96	22,681	16,676	21,937	25,017
Ashtland.....	7,784	7,045	13,124	12,317	78	58	36,075	28,296	13,924	14,881
Ashtabula.....	11,132	10,960	24,386	23,855	53	43	25,228	20,201	5,475	5,990
Athens.....	5,349	5,063	10,836	9,175	190	177	40,861	34,310	4,525	4,360
Auglaize.....	9,171	8,883	14,705	13,265	177	175	13,743	10,907	22,433	22,524
Belmont.....	10,249	9,239	19,871	17,055	382	386	89,370	62,292	12,560	10,375
Brown.....	7,313	7,014	10,879	10,617	291	238	11,910	9,611	19,063	21,887
Butler.....	11,837	11,349	12,842	12,842	649	237	10,252	7,721	19,947	18,642
Carroll.....	5,833	5,189	12,226	11,067	96	75	78,584	52,566	9,493	8,316
Champ. gn.....	11,809	11,301	15,714	13,955	175	154	31,663	21,431	22,837	22,337
Clark.....	11,392	11,661	13,725	14,729	207	213	28,653	27,733	27,733	21,225
Clermont.....	7,667	7,292	10,310	9,624	679	645	28,818	7,208	13,094	14,567
Columbiana.....	10,480	9,773	12,006	12,558	362	354	43,213	33,751	25,734	29,279
Coshocton.....	7,391	7,564	16,234	17,705	128	87	91,376	33,974	11,711	11,175
Crawford.....	8,631	8,406	14,519	14,726	110	86	53,811	75,850	14,560	13,897
Cuyahoga.....	18,833	20,269	14,392	15,232	91	86	2,976	41,043	25,244	27,992
Delaware.....	15,700	15,061	15,371	15,232	104	144	8,350	6,348	2,362	2,362
Delaware.....	6,748	6,071	20,637	16,764	409	403	8,350	5,792	31,446	33,085
Delaware.....	9,161	8,401	8,481	7,782	36	87	14,064	12,063	12,169	14,229
Delaware.....	5,994	5,600	14,429	13,283	60	63	33,635	41,644	20,199	18,517
Delaware.....	10,533	9,807	6,980	6,800	21	26	16,085	12,890	7,498	8,471
Franklin.....	11,143	9,763	19,073	16,783	143	120	21,589	13,589	28,287	26,493
Franklin.....	18,136	15,892	16,143	13,502	260	198	20,952	13,498	27,504	32,360
Fulton.....	7,653	7,376	19,846	16,972	147	131	15,771	10,838	26,376	22,814
Gallia.....	5,673	5,315	12,855	12,548	40	30	24,754	20,473	18,250	19,793
Geauga.....	5,780	5,821	10,324	9,237	281	246	20,024	13,946	7,548	7,678
Greene.....	11,510	10,918	17,243	16,067	48	55	18,257	14,709	4,322	4,322
Guernsey.....	6,911	6,079	15,027	14,508	240	191	22,953	18,342	25,650	22,009
Hamilton.....	20,330	19,354	14,553	11,919	183	191	38,459	63,368	9,063	7,976
Hancock.....	11,405	10,913	19,086	18,595	1,572	1,448	3,289	2,620	11,398	10,678
Hardin.....	8,457	8,177	12,362	12,067	121	105	41,912	33,887	31,991	31,991
Harrison.....	5,780	5,274	11,335	12,067	161	155	43,532	30,873	22,737	22,737
Henry.....	7,167	6,891	17,712	11,380	403	47	121,599	92,134	6,778	6,180

TABULAR STATEMENT EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC.—Continued.

Counties.	Number of horses.		Number of cattle.		Number of mules.		Number of sheep.		Number of hogs.	
	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.
Highland	9,298	9,252	16,282	14,514	291	265	23,300	18,692	28,711	31,145
Hocking	3,980	4,046	8,821	8,192	85	87	23,392	17,769	6,114	6,647
Holmes	6,972	6,408	16,767	13,980	103	96	25,392	25,198	18,254	16,146
Huron	8,870	8,400	12,648	12,435	84	87	51,170	46,321	4,613	4,613
Jackson	3,808	3,692	9,663	8,871	784	808	14,769	11,827	4,416	4,613
Jefferson	6,813	6,212	11,133	8,815	196	180	65,203	46,273	7,364	6,684
Knox	9,213	8,592	16,303	14,363	117	111	103,200	76,411	19,121	18,344
Lake	4,869	4,614	6,306	6,026	30	26	9,680	7,914	1,955	1,955
Lawrence	4,301	3,685	7,695	6,544	635	515	5,631	3,619	5,116	4,651
Licking	14,037	13,915	23,948	22,356	115	126	115,600	92,243	26,000	26,000
Logan	10,685	8,690	14,711	13,324	103	72	44,530	34,337	21,919	20,246
Lorain	10,268	8,690	10,192	19,107	47	33	30,668	25,019	8,372	8,128
Lucas	8,506	8,749	7,695	7,823	125	67	4,044	2,736	7,646	7,440
Madison	10,652	10,392	18,918	15,490	268	239	47,704	31,854	30,443	26,147
Mahoning	8,621	8,142	12,152	11,779	98	86	37,578	26,877	8,227	7,507
Marion	9,532	9,029	15,301	14,501	143	124	56,109	32,006	25,192	21,776
Medina	8,971	8,326	13,749	15,240	236	137	40,894	32,006	9,278	8,932
Melgs	5,955	5,679	10,863	8,912	284	289	39,668	27,775	5,584	4,705
Mercer	9,061	8,285	14,812	14,035	162	143	12,222	9,069	28,391	27,212
Miami	11,959	11,289	13,405	12,455	280	240	6,253	4,470	15,487	13,631
Monroe	5,777	5,905	12,843	9,786	73	62	25,833	14,230	6,480	5,344
Montgomery	16,853	16,133	18,618	17,048	265	255	5,194	3,535	20,873	20,618
Morgan	6,382	5,571	12,878	11,128	53	52	72,902	54,892	7,379	8,874
Morrow	8,412	7,561	12,434	11,562	57	50	72,902	54,892	12,942	13,457
Muskingum	11,034	10,627	23,786	21,363	222	201	105,392	82,945	14,349	13,340
Noble	5,230	4,626	12,774	10,400	52	44	61,070	40,047	8,047	7,417
Osage	5,493	5,438	7,669	7,634	27	20	7,977	6,014	9,759	9,356
Paulding	4,780	4,640	4,566	5,245	54	50	6,726	5,242	8,896	10,488
Perry	6,712	6,301	13,987	12,349	124	115	37,622	27,715	10,062	9,269
Pickaway	10,754	10,502	20,047	17,737	301	287	13,615	9,969	30,124	27,742
Pike	4,751	4,317	5,499	5,131	246	253	7,989	5,909	7,767	6,828
Portage	8,930	8,444	19,654	17,033	70	93	33,362	25,332	7,809	7,321
Preble	9,932	9,518	12,805	13,330	298	210	9,042	7,144	25,837	23,840
Punam	9,141	8,821	13,221	13,331	94	74	13,133	10,290	33,019	33,747
Richland	9,474	9,030	14,863	13,903	177	151	47,051	34,266	19,459	20,087
Ross	12,730	12,132	18,972	16,916	236	182	17,885	11,387	27,039	24,852
Sandusky	9,008	9,182	12,807	12,386	80	78	20,375	16,783	22,245	22,245
Seneca	5,895	5,312	8,227	7,995	842	787	2,973	2,341	7,400	8,259
Shelby	12,068	10,366	16,032	15,483	104	90	39,655	32,004	31,313	33,435
Shelby	8,901	8,610	14,018	14,159	124	110	8,414	6,814	19,184	18,974

TABULAR STATEMENT EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC. - Concluded.

Counties.	Number of horses.		Number of cattle.		Number of mules.		Number of sheep.		Number of hogs.	
	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.	1895.	1896.
Stark.....	15,575	15,443	24,989	24,692	372	356	33,802	26,215	22,489	22,611
Summit.....	9,905	9,323	17,426	16,848	90	72	13,442	9,935	9,281	9,028
Tumbull.....	12,203	11,941	26,594	26,089	68	65	40,339	30,041	6,968	7,800
Tuscarawas.....	8,950	8,483	20,344	19,277	130	125	45,206	32,781	14,183	14,859
Union.....	8,557	7,704	12,953	11,069	6	49	53,688	37,395	22,494	21,239
Van Wert.....	8,962	8,901	10,919	10,522	167	178	13,045	10,595	24,872	22,469
Vinton.....	2,948	2,814	6,242	5,475	144	146	27,799	22,420	2,980	3,254
Warren.....	10,285	9,742	12,129	11,537	475	407	16,288	14,408	20,165	16,525
Washington.....	8,135	8,110	15,509	13,798	192	183	52,576	38,472	8,767	7,739
Wayne.....	11,685	11,217	21,435	20,720	155	171	29,808	22,823	22,814	22,709
Williams.....	7,346	6,672	11,020	11,009	83	68	26,659	22,376	17,194	19,130
Wood.....	11,107	11,159	15,788	14,974	241	130	26,816	20,374	25,162	26,397
Wyandot.....	7,641	7,216	10,757	10,403	63	71	68,026	59,462	23,930	23,678
Totals.....	795,967	759,570	1,252,888	1,175,424	17,942	16,362	3,004,636	2,293,686	1,437,450	1,409,345

Horses, 36,397 decrease; Cattle, 77,404 decrease; Mules, 1,580 decrease; Sheep, 710,950 decrease; Hogs, 28,104 decrease.

OFFICE OF THE AUDITOR OF STATE,

COLUMBUS, O., August 18, 1896.

I hereby certify the foregoing to be a true copy, taken from the reports of the several county auditors, as returned to this office.

W. D. GUILBERT,
Auditor of State.

OHIO STATE FAIR

— AND —

INDUSTRIAL EXPOSITION,

Columbus, August 31, September 1, 2, 3, 4, 1896.

BULLETIN OF ENTRIES AND AWARDS.

Herewith is presented a Bulletin of the Forty-sixth Annual Ohio State Fair and Industrial Exposition. It embraces a list of entries and awards in the live stock departments; awards in premium departments other than live stock, and a list of exhibitors in the departments of machinery and agricultural implements, manufactures, merchandise, music, etc., where no premium competition was entered into.

Every department, class and division of the fair was so complete and perfect in representation, that no one department is deserving of special mention more than another. The common expression of visitors directed attention to the completeness in detail and the grand illustrations of Ohio's industries presented in every building.

The State Board of Agriculture exerted every effort to bring about an exposition worthy the name and worthy the state; an exposition that should fill all the requirements, from an educational point of view, and attain the prime object for which the fair is established, viz.: the encouragement of improvement in agriculture and live stock, mechanics and household arts and the industries allied thereto. The success of the Board's efforts in these directions is highly satisfactory, while the favorable comments of press and people are most flattering.

The Governor of the State, Hon. Asa S. Bushnell, expressed his view of the fair in the following communication :

STATE OF OHIO, EXECUTIVE DEPARTMENT,
OFFICE OF THE GOVERNOR,COLUMBUS, *Sept. 5, 1896.*

HON. W. W. MILLER,

Secretary Ohio State Board of Agriculture, Columbus, Ohio.

My Dear Captain Miller:

Permit me to offer through you to the officers of the Ohio State Board of Agriculture my heartiest congratulations upon the eminent success achieved by the Ohio State Fair. In my opinion, the exhibits and all the details of the exhibition were remarkably fine and complete, and I think that such must be the verdict of all who viewed them. Such an enterprise as the State Fair cannot fail to be of great interest and pleasure to all the people who attend, and I am sure that the lessons contained in such an exhibition are valuable to us all in many ways.

Again offering my sincere congratulations and thanking you for the courtesies extended to me, I am

Very cordially yours,

ASA S. BUSHNELL.

During the year many improvements were made to the beautiful grounds upon which the fair is held, and to the substantial exposition buildings in which the exhibits are displayed, while to the grand stand, cattle amphitheatre and other buildings for public comfort, many improvements and repairs were made. Nothing was left undone, within the means of the Board, to preserve and beautify this state property and to make it a fitting and inviting place for exhibitors and visitors during the annual occasions of the State Fair.

To protect the Grant Cottage, presented to the Board for the grounds, by the Hon. Henry T. Chittenden, a memorial building was constructed by the Board, that is a lasting tribute of the farmers of Ohio, to the memory of the great general, and is an ornament to the park grounds. On Thursday of the fair, this memorial building was dedicated. Appropriate ceremonies were participated in by the Governor and a portion of his staff, the State Board of Agriculture, Hon. Henry T. Chittenden, the donor of the cottage, Rev. W. R. Parsons, the Ohio National Guard, and the 14th Regiment Band, the program of exercises being carried out as follows:

At 2 o'clock P. M. companies A, B, C and D, of the 14th Regiment, under command of Major John C. Speaks, Battery H and the 3d Regiment of the Boys' Brigade assembled at the south gate to meet the Governor. He was accompanied by Mrs. Bushnell, Private Secretary Rodgers, Hon. Henry T. Chittenden, President J. C. Bower and W. W. Miller, of the Board of Agriculture and the members of the Governor's staff. The party was escorted in carriages about the grounds and to the scene of the dedicatory exercises—the south front of the memorial building.

Secretary Miller presided at the meeting, a large concourse of people

being present. An invocation was pronounced by Rev. W. R. Parsons, who invoked the blessings of the Almighty on the exercises about to be performed, remembering the blessings that have been ours in the past, in the examples of such men as the one whom we honor. At the conclusion of the simple, yet eloquent prayer, the 14th Regiment Band, fired the patriotic enthusiasm of the assembly by playing "America."

Secretary Miller then introduced Hon. Henry T. Chittenden, who delivered the following address:

Mr. Chairman, Ladies and Gentlemen:

We have gathered about this now consecrated spot to complete an affair which had its beginning some eight years ago, or rather perhaps more properly, some eighty years ago, for about that time has elapsed since the little cottage which we here see was reared upon the bank of the Ohio to be the home of an industrious pioneer of our splendid State, which has become since then recognized far and near as pre-eminently the mother of great men.

The eminent soldier whose memory brings us here to-day was like most of those who have been distinguished as doing grand things in the world's affairs—markedly a silent man. He believed, undoubtedly, that while speech, and perhaps speech-making, is silver, silence is golden, and he preferred the latter metal, or, as a great thinker puts it, that speech is for time and silence is for eternity. Let us imitate him in that as in other things attainable by us. I will have the soul of wit in my remarks if not the substance of it.

In entering upon this great matter I shall sink all considerations of false modesty and speak of that which I know without regard to accusations of egotism or bad taste. The splendor of his renown, whom in this day we recall, makes unimportant any illusion to myself, and the need of having a record for the satisfaction of those who look through this well nigh imperishable glass in future years, calls upon me for statements which otherwise might be inappropriate.

As to the history of this cottage, within whose second and last room, about 7 by 12 feet in size, General Grant was indisputably born, it is that it was built by his father, Jesse Root Grant, upon the banks of the Ohio in Clermont county, in the year 1820, preparatory to his marriage. From that point it was transferred to Cincinnati by boat in the year 1888; from that point to these grounds, on the southeastern part of which it was set up in the same year, and from this last point, under the recommendations of our distinguished Governors, it has been transferred by the patriotic State Board of Agriculture to this its final resting place and covered with an enduring and tasteful dome of glass and steel as you now see it.

Upon each removal, extreme care, involving in each case an expenditure of money far beyond the first cost of the building, has been exer-

cised to transfer and replace every particle of the building as it was found to be after Grant's glorious achievements had thrown a lustre and sacredness about his every belonging and made this humble house sacred to the American people. Nothing was added and nothing was taken away, and it stands to-day in external aspect as it stood for more than half a century looking out upon the glancing waters of the beautiful river.

As to its authenticity and persistency of condition there is no particle of doubt. When I visited it for the first time in company with Mr. William F. Burdell, of Columbus, Ohio, in the interests of the Board of Directors of the Centennial of Ohio, in 1888, the price demanded for it—being three thousand dollars—made it important that we should be assured that it was in all respects what it purported to be, and testimony was taken and affidavits were made which left no doubt in our minds upon that point. Sketches were taken of its actual condition, and that condition was accurately reproduced before payment was made for its removal to these grounds. It is interesting, it seems to me, to state that the picture of his birthplace, produced in General Grant's own autobiography, shows a front just such as this; that the physician, who was then the family doctor of the Grant family, has visited the house since it stood in this inclosure and recognized its familiar features, and that Mrs. Ulysses S. Grant wrote to me a letter during the Centennial of 1888, which will be deposited with the State Board of Agriculture, and which fully recognizes all that we claim for the humble reminder of his birth, which here I deliver once more to the care of the people of his native state, to shine like a gem on her fair bosom, to endure while liberty and union last, to be the Mecca of millions of grateful pious pilgrims and to present to unborn generations the most impressive and instructive of lessons for the conduct of life, especially when all is completed and accentuated by the erection of his statue as he appeared on horseback in captaincy of a million of unapproachable soldiery—a work of art whose erection is practically assured, as I am given to understand by the liberality of one of Ohio's most distinguished and honored citizens.

You, whose exalted and most profitable business it is to study and determine the effects of proper intermingling of blood and characteristics, may well take time to consider in passing of how great importance is the great diversity of nationalities which has gone to the making up of the population of nearly 5,000,000 which now enjoys the unsurpassed opportunities for being, for development and for enjoyment presented by this first state in the Union. And so considering you will soon come to the conclusion, I think, that although contrasted with the shrewdness and self-denial of the New Englander, the industry and persistency of the German, the gallantry and politeness of the Southerner, and the vivacity and humor of the Irishman, yet the caution, the insight and the thrift of the Scotchman qualifies him for an equal hope in the contest for good things

and renders probable a more than ordinary success in the race which our admirable institutions throw open and make attractive to all men.

Of such stock was the baby who first complained of mortal ills in this little room on the 22d day of April, A. D. 1822. His father's fathers had come to this country from Scotland in the early part of the eighteenth century; had settled in Connecticut; had served their country well in the various wars, including that for independence, and had sent forth their son, Jesse Root Grant, to make to blossom as the rose a little part of that rich wilderness which was then more remote from their New England home than is now any part of the globe from this smiling scene.

Mrs. Grant, who was also of Scotch origin, was known to her neighbors as a woman of unusual firmness and strength of character, as a consistent, exemplary, God-fearing member of the Methodist church from her youth, a constant and devoted wife, a careful, loving, watchful mother, the solace and support of her husband, the adviser and guide of her children. "It is not strange," says a biographer, "that the offspring of such parents should be virtuous, honest and truthful. But if there is anything good in blood and race, aided by judicious training and honorable example, such a family should contain within itself a model of all that is excellent in woman or admirable in man."

I shall not abuse your patience by recounting the life or eminent services of General Grant. His record is a possession forever to the American people, familiar in their mouths as household words. Suffice it to say that he was born in yonder cottage, that he grew to manhood, and almost to middle age, in the discharge of ordinary duties of life; that then, as Washington and his compeers watched over and made possible the birth of our nation, as Jefferson and his associates at the end of the first generation notified France and England, and all the world, that our country had come of age and proposed to take care of itself, as at the end of the second generation Jackson choked the serpent of treason and sent it back to its lair scotched but not killed, so Grant and his fellows at the end of the third generation saved the Nation's life and sent her forward on a bounding career of usefulness and glory. Would to God, fellow citizens, that he were with us now to guide and assist us in saving the two better parts of those inestimable treasures which the fathers pledged to the sustaining of their proclamation of independence. He saved our life, and would to God, I say, that at the beginning of our fifth generation he were here to tell us how to save our fortunes and our sacred honors. For it is curious to observe how imperative is perpetual vigilance to the preservation of liberty, and how necessary it has been at the end of each thirty years to recur to the principles and rules which the wise men of '76 laid down for our protection from the dangers which they saw to be inherent in the matter of self-government.

While I never was on familiar terms with General Grant yet it happened that I three times took him by the hand. On the first occasion

we were both residents of Galena, a little city of Illinois, a mining town, built in a gulch so that the cross streets are made of wooden stairs. Then I occupied an office immediately over his father's leather store, where he served behind the counter faithfully for about one and one-half dollars per day. In that city, just before the war, I had the honor of addressing him and others in a Fourth of July address, in which I confidently predicted and earnestly prayed for a continuance of the Union, without rebellion and without bloodshed. I next saw him at the height of his official career in Washington, just after his election for the second time to the Presidency by an almost unanimous vote of the states. And for the third and last time I saw him in Columbus, when our people thronged to honor him who was just returning from his journey around the world, wherein he had been the guest of kings and emperors, himself the first representative of the richest and most powerful people on the globe when united and of one purpose, bar none.

In each case I found Grant the same stout, imperturbable, sphynx-like man—a man of about five feet seven in stature, of about 160 pounds in weight, of compact figure, with heavy shoulders, a brown spade beard and moustaches of the same effect, an impenetrable gray eye, a strong, determined jaw, and of careless yet reassuring manners.

After this you know how well he died; how he looked calmly and fearlessly at the inevitable doom; how he occupied himself in his last hours with sending to his countrymen messages of peace and personal good will; and how now, in wonderful contrast with this humble and decaying birth cottage, then standing solitary by the placid Ohio, hearing only the puff of the 'scape pipe, the cry of the raftsmen, the scream of the owl or piping of the quail, there is rising in the heart of the busy metropolis on the banks of the majestic Hudson a mausoleum of unequalled magnificence, permanent in appearance as the very rock from which it rises—a mausoleum almost at this very hour being visited as the first of duties and sacred pleasures by the first of Chinese, the representative of an empire that was great before Columbus entered upon his momentous voyage; an empire governing 400,000,000 of bodies, a people the inventors of gunpowder, of which Grant consumed more than any man that ever lived; an empire which sneers at all others as outside barbarians, harboring a people which defends its frontier by walls of masonry; where the mental training of woman is not considered; where foreigners are thought to use the bodies of babies in the foundations of their temples; which uses silver for its currency, and flies in large numbers before squads of Japanese when guns are pointed at their battalions in a careless way.

The important characteristics of Grant were, first, his firmness of will. Mrs. Grant, in speaking of some campaign of his, said that he was an obstinate man; and obstinacy, or persistency in good purpose, was what finally won for him the success which made his name imperishable and this occasion possible.

Another characteristic of Grant was his simplicity. He issued no high-sounding phrase, such as is fitted to arouse French enthusiasm, like that of Napoleon when he said: "Soldiers, from yonder pyramids forty centuries look down upon you." No; he said: "I propose to fight it out on this line if it takes all summer."

There was never any pomp and circumstance about him. "When I started from the river to invest Vicksburg," says he, "I took my horse and a tooth-brush." He was brave—for he was an American. He was patriotic—he was patient.

Honor the man of long-enduring blood
Our statesman, warrior, moderate resolute.
Whole in himself a common good.
Honor the man of amplest influence
Yet clearest of ambition's crime.
Our greatest yet with least pretense.
Great in council and great in war
Foremost captain of his time.
Rich in saving common sense
And as the greatest only are
In his simplicity sublime.

And so with reverence we salute and leave the birth-hall of that great spirit. And we turn our eyes to the empyrean trustful that in the Valhalla of heroes that great spirit is still watching with love and hope and care over the fortunes of the great bark which once he saved from disruption upon the rude rocks of secession. Great spirit be with us still. Hover above and guide us, and may to-morrow's sun see every sail distended with the trade winds of confidence and employment, upon the bridge an executive who commands from truck to keel, in the pilot house a supreme authority not changed from day to day, and in the cabin, where all may see, a chart of depths and shoals and quick sands to control the destinies of the great Republic, whose life for mankind's good should last while lasts the world ripening as it rolls.

After music by the band, Governor Bushnell was introduced and spoke briefly on the appropriateness of the movement on the part of the citizens to establish a monument to the memory of one of the most honored sons of the great state. The governor commended Mr. Chittenden for his unstinted generosity in placing the cottage on the grounds and the board of agriculture in later providing a shelter for it in order that it might not be soon removed by the ravages of the weather. A glowing compliment was paid by the governor to the members of the national guard for the part taken by them in the exercises. The military career made by General Grant was the most glorious in the history of the nation and it was his achievement as a soldier that brought before the people his true character.

When Governor Bushnell had finished his address, the band struck

up "The Star Spangled Banner," and as the last notes of that grand old national air died away, the national guard was brought to the "present," the national salute was fired by the detachment of battery H and the stars and stripes were run up on the pole over the building. When the salute, which consisted of several rounds, was finished, the band played "Hail Columbia," after which the formal exercises were concluded with the benediction by Rev. W. R. Parsons.

The doors of the building were then thrown open and visitors were allowed to pass through the cottage.

ENTRIES AND AWARDS

IN

LIVE STOCK DEPARTMENTS.

NOTE.—Throughout the live stock departments, third premium is a white ribbon, given at time the animals were passed upon.

HORSES—THOROUGHBREDS.

C. BORDWELL, Member in Charge.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
E. Hickey, Clay Lick, O.....	King.....	Secood.	\$10 00
S. C. Hoffman, Circleville, O.....	Reply.....	First.....	20 00
F. C. Lampe, Jeffersonville, O.....		Third.....	
Same			
<i>Stallion 3 years old and under 4.</i>			
W. H. Ohlmar, Columbus, O.....	Gen'l Montrose.....	First	20 00
E. O. Mitchell, Newark, O.....			
<i>Stallion 2 years old and under 3.</i>			
E. Hickey, Clay Lick, O.....	Longfellow.....	First	10 00
<i>Stallion Colt.</i>			
W. H. Snyder, Newark, O.....		Second.	3 00
S. C. Hoffman, Circleville, O.....		First.....	5 00
<i>Mare 4 years old and over.</i>			
E. Hickey, Clay Lick, O.....	Bonnie Maid.....	First	15 00
Same	Queen.....		
W. H. Snyder, Newark, O.....	Twilight.....		
Same	Novelette.....	Third.....	
McLean and Wendel, Washington C. H., O.....	Tiddlerwink.....	Second.	10 00
S. C. Hoffman, Circleville, O.....	Alta.....		
F. C. Lampe, Jeffersonville, O.....			
Same			
<i>Filly Colt.</i>			
E. Hickey, Clay Lick, O.....		Second	3 00
Same			
W. H. Snyder, Newark O.....		First.....	5 00

Chas. Woodward, Perintown, O., *Expert Judge.*

ROADSTERS—STANDARD BRED.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
J. A. Hall, Columbus, O.....	George T. Putnam.....	Second.	\$10 00
Harris Egolf, Etna, O.....	Gov. McKinley.....	Third.....	
Woodside Stock Farm, Middletown, O.....	Col. Bullitt.....	First.....	20 00
J. W. Rothrock, Washington, C. H., O.....	Bobby Burns.....		
S. W. Blackwood, Lithopolis, O.....	Charlie Cecil.....		
F. Shallenberger & Co., Amanda, O.....	Fairfield Boy.....		

HORSES—STANDARD BRED—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 3 years old and under 4.</i>			
R. F. Myers, Dayton, O.	Brinley.....	Third.....	
J. A. Bell & Son, Ashley, O.	Dr. Dan.....	Second.....	\$10 00
Woodside Stock Farm, Middletown, O.	Major C.....	First.....	20 00
H. W. Cookston, Cochranton, O.			
A. R. Miller, Pataskala, O.			
<i>Stallion 2 years old and under 3.</i>			
E. G. Corbett, Columbus, O.	Double Hal.....		
W. C. Davis, Columbus, O.	Jerry Wilkes.....	First.....	10 00
<i>Stallion 1 year old and under 2.</i>			
Woodside Stock Farm, Middletown, O.		First.....	10 00
<i>Stallion Colt.</i>			
A. R. Miller, Pataskala, O.		First.....	3 00
<i>Mare 4 years old and over.</i>			
J. A. Hall, Columbus, O.	Hanarinda.....	First.....	15 00
B. F. Parsell & Son, Reynoldsburg, O.	Minnie Parsell.....		
John C. Price, Harrisburg, O.	Maret.....		
Woodside Stock Farm, Middletown, O.	Extasia.....	Second.....	10 00
S. H. Turner, Columbus, O.	Anisetta.....		
A. R. Miller, Pataskala, O.		Third.....	
<i>Mare 3 years old and under 4.</i>			
G. W. Greeno, Columbus, O.	Sally G.....		
<i>Mare 2 years old and under 3.</i>			
J. A. Bell & Son, Ashley, O.	Pretty Fawn.....	Second.....	5 00
J. T. Deardoff, Lebanon, Ohio.....	Arborday.....		
E. Steen, Washington C. H., O.		First.....	10 00
<i>Filly 1 year old and under 2.</i>			
John C. Price, Harrisburg, O.	Baby Belle.....	First.....	10 00
<i>Filly Colt.</i>			
A. R. Miller, Pataskala, O.		First.....	5 00
<i>Mare with two of her progeny.</i>			
A. R. Miller, Pataskala, O.		First.....	15 00
Chas. Woodward, Perintown, O., <i>Expert Judge.</i>			

ROADSTERS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
Daniel Hickman, Reynoldsburg, O.	Truro Wilkes.....	First.....	\$20 00
James Alexander, Columbus, O.	Central Wilkes.....		
J. T. Deardoff, Lebanon, O.	Distinction.....	Second.....	10 00
H. B. White, Grove City, O.	Bud White.....	Third.....	
<i>Stallion 3 years old and under 4.</i>			
Wilson Rush, Reynoldsburg, O.		Second.....	10 00
James Alexander, Columbus, O.	Harry Churchill.....	First.....	20 00

ROADSTERS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 2 years old and under 3.</i>			
T. Shallenberger & Co., Amanda, O.....	Harry	First.....	\$10 00
<i>Stallion 1 year old and under 2.</i>			
Wm. Scheim, Plain City, O.....	Robber Boy.....	First.....	10 00
<i>Stallion Colt.</i>			
J. S. Wolf, Reynoldsburg, O.....	George W.....	Third.....	.....
J. A. Bell & Son, Ashley, O.....	Red Wilkes, Jr.....	First.....	5 00
G. W. Hiskett & Sons, Fulton, O.....	.....	Second.....	3 00
Van Schoyck & Parsell, Reynoldsburg, O.....	.....	.....	.....
<i>Mare 4 years old and over.</i>			
D. Westwater, Columbus, O.....	Mary Lee.....	Second.....	10 00
P. E. Elliott, Alton, O.....	Belladonna.....	.....	.....
D. A. Lane, Commercial Point, O.....	.....	.....	.....
J. A. Bell & Son, Ashley, O.....	.....	.....	.....
Woodside Stock Farm, Middletown, O.....	Bozenta.....	First.....	15 00
J. N. Walker, Plain City, O.....	.....	Third.....	.....
Wm. Scheim, Plain City, O.....	Anna.....	.....	.....
<i>Mare 3 years old and under 4.</i>			
J. A. Bell & Son, Ashley, O.....	.....	Second.....	5 00
B. F. Parsell & Son, Reynoldsburg, O.....	.....	First.....	10 00
<i>Mare 2 years old and under 3.</i>			
Oscar Dixon, Galena, O.....	Bessie Wilkes.....	Second.....	5 00
B. F. Parsell & Son, Reynoldsburg, O.....	Ruby.....	Third.....	.....
Woodside Stock Farm, Middletown, O.....	Sister Mary.....	First.....	10 00
<i>Filly 1 year old and under 2.</i>			
Oscar Dixon, Galena, O.....	Pretty Girl.....	Second.....	5 00
H. L. Kinniard, Camp Chase, O.....	Minnie K.....	.....	.....
O. Whitson, New Burlington, O.....	Lady Hal.....	First.....	10 00
A. R. Miller, Pataskala, O.....	.....	.....	.....
<i>Filly Colt.</i>			
W. B. Kinder, Westerville, O.....	Nelly Bly.....	First.....	5 00
T. Shallenberger, Amanda, O.....	Miss Ivy.....	Second.....	3 00
<i>Mare with 2 of her progeny.</i>			
J. S. Wolf, Reynoldsburg, O.....	Dolly.....	Third.....	.....
J. A. Bell & Son, Ashley, O.....	Black Lady.....	Second.....	10 00
G. W. Hiskett & Sons, Fulton, O.....	Dolly Almont.....	First.....	15 00
Van Schoyck & Parsell, Reynoldsburg, O.....	.....	.....	.....

Chas. Woodward, Perintown, O., *Expert Judge.*

MORGAN.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
McLaughlin Bros., Columbus, O.....	Bayard Morgan	First.....	\$20 00

Chas. Woodward, Perintown, O., *Expert Judge.*

AGRICULTURAL REPORT.

FRENCH AND GERMAN COACH.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
McLaughlin Bros., Columbus, O		First.....	\$ 20 00
Same		Third.....	
Geo. W. Kline & Son, Greenwich, O			
Plain City Horse Co., Plain City, O	Agobard.....	Second.	10 00

C. H. Ganson, *Expert Judge.*

HACKNEYS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
McLaughlin Bros., Columbus, Ohio.....	Mirfield Confidence.....	First.....	\$ 20 00

Chas. Woodward, Perintown, O., *Expert Judge.*

GRADE COACH.

Owner's Name and Post-office.	Name of Animal,	Premium.	Amount.
<i>Gelding or Mare 4 years old and over.</i>			
E. L. McCollem, Columbus, Ohio.....	Fox.....	First.....	\$ 10 00
J. G. Koerner, Alton, O.....	Dan.....		
G. W. Hiskett & Sons, Fulton, O.....	Prince.....	Second.	5 00
Otho Curl, Cardington, O	Charley.....	Third.	
Theo. Shallenberger & Co., Amanda, O.....	Lottie.....		
<i>Gelding or Mare 3 years old and under 4.</i>			
B. F. Parsell & Son, Reynoldsburg, O.....	B. F. P.....		
C. W. Mark, Washington, C. H., O.....		Third.	
Otho Curl, Cardington, O	Prince.....	First.	10 00
Theo. Shallenberger & Co., Amanda, O.....	Tobe.....	Second.	5 00
A. R. Miller, Pataskala, O.....			
<i>Gelding or Mare 2 years old and under 3.</i>			
G. W. Hiskett & Sons, Fulton, O	Highflyer.....	First.....	10 00
P. J. Schaaf, Troyton, O.....	Sandy.....	Second.	5 00
<i>Gelding or Mare 1 year old and under 2.</i>			
John C. Price, Harrisburg, O.....	Baby Belle.....		
J. A. Bell & Son, Ashley, O		First.....	10 00
Theo. Shallenberger & Co., Amanda, O.....	Bryan.....	Second.	5 00

Chas. Woodward, Perintown, O., *Expert Judge.*

ENTRIES AND AWARDS.

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FRENCH DRAFT.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
Jules Guillaumin, Grosse Isle, Mich.....	Mon Voisin	First	\$20 00
McLaughlin Bros., Columbus, O.	Rai .....	.....	.....
Same	Jaures .....	.....	.....
Blanqui Horse Co., Plain City, O.	Blanqui	Third .....	.....
C. M. Jones, Plain City, O.	Moreri	Second	10 00
<i>Stallion 3 years old and under 4.</i>			
P. J. Schaaf, Troyton, O.	Brown	First	20 00
<i>Mare 4 years old and over.</i>			
A. J. Torbert, Plain City, O.	Fillet	First	15 00
<i>Mare 3 years old and under 4.</i>			
A. J. Torbert, Plain City, O.	Margaret	First	10 00

T. A. Johnston, *Expert Judge.*

CLYDESDALE AND SHIRE.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
J. L. Ropp, Marey, O.	Ferdinand	First	\$20 00

T. A. Johnston, *Expert Judge.*

BELGIAN.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 4 years old and over.</i>			
E. Courtright, Galloway, O.	Parrot	First	\$20 00

GRADE DRAFT.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Gelding or Mare 4 years old and over.</i>			
John Fladt, Hilliard, O.	Flora	Third .....	.....
Same	Betsey	Second	\$5 00
Samuel Taylor, Plain City, O.	Queen	First	10 00
J. Luther Ropp, Marey, O.	Gin .....	.....	.....

AGRICULTURAL REPORT.

GRADE DRAFT—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Gelding or mare 3 years old and under 4.</i>			
H. L. Kinniard, Camp Chase, O.....	Topsie.....		
J. M. Koerner, Alton, O.....	Sallie.....		
Samuel Taylor, Plain City, O.....	Belle.....	First.....	\$10 00
A. J. Torbert, Plain City, O.....	Duke.....	Second.....	5 00
E. P. Koloson, West Berlin, O.....	Nellie.....	Third.....	
<i>Gelding or mare 2 years old and under 3.</i>			
John Fladt, Hilliard, O.....	Daisy.....	Second.....	5 00
A. M. Gibson, Camp Chase, O.....	Marie.....		
Samuel Taylor, Plain City, O.....	Bird.....	First.....	10 00
A. J. Torbert, Plain City, O.....	Frank.....		
<i>Gelding or mare 1 year old and under 2.</i>			
John Fladt, Hilliard, O.....	Nellie.....	First.....	10 00
A. M. Gibson, Camp Chase, O.....	Dan.....	Second.....	5 00
J. G. Koerner, Alton, O.....	Star.....	Third.....	
<i>Colt.</i>			
J. Luther Ropp, Marcy, O.....	Maud.....	First.....	5 00

S. C. Dickerson, Cadiz, O., *Expert Judge.*

MATCHED TEAMS AND FANCY DRIVERS.

Owner's Name and Post-office,	Name of Animal.	Premium.	Amount.
<i>Pair matched roadsters.</i>			
Mrs. C. W. Ball, So. Charleston, O.....	Baby Bunting and Mate.	Third.....	
I. S. Keeton, Lattas, O.....	Extasia and Bozenta.....	Second.....	\$10 00
Woodside Stock Farm, Middletown, O.....	Carl W. and Duluth.....	First.....	20 00
S. H. Turner, Columbus, O.....			
<i>Pair grade draft geldings or mares.</i>			
John Fladt, Hilliard, O.....	Flora and Betsey.....		
J. G. Koerner, Alton, O.....	French and Maud.....	Third.....	
James Kincaid, Columbus, O.....	Pat and Pearl.....	First.....	15 00
A. J. Torbert, Plain City, O.....		Second.....	10 00
<i>Pair grade coach geldings or mares.</i>			
Samuel Taylor, Plain City, O.....	Belle and Bird.....		
S. H. Turner, Columbus, O.....		First.....	15 00
McLaughlin Bros., Columbus, O.....		Second.....	10 00
Otho Curl, Cardington, O.....	Prince and Charley.....	Third.....	
<i>Gentleman's fancy driving team.</i>			
Arch Walker, Plain City, O.....	Bob and Harry.....	Second.....	10 00
Mrs. C. W. Ball, So. Charleston, O.....	John L. and Young Traveler.....	First.....	20 00
Woodside Stock Farm, Middletown, O.....	Extasia and Bozenta.....		
S. H. Turner, Columbus, O.....	Carl W. and Duluth.....		
I. S. Keeton, Lattas, O.....	Twin Bros.....		

MATCHED TEAMS AND FANCY DRIVERS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Gentleman's fancy, single driver.</i>			
D. Westwater, Columbus, O.....	Mary Lee.....	Third	
B. F. Parsell & Son, Reynoldsburg, O.....	Col. Arthur.....		
E. E. Harrold, Columbus, O.....	Robb H.....		
H. L. Kimmiard, Camp Chase, O.....	Tony K.....		
Mrs. C. M. Ball, So. Charleston, O.....	John L.....	Second	\$5 00
I. S. Keeton, Lattas, O.....			
Woodside Stock Farm, Middletown.....	Bozenta.....		
G. W. Hiskett & Sons, Fulton, O.....	Sandy.....		
S. H. Turner, Columbus, O.....	Hiaway.....		
J. W. H. Stalter, Wagram, O.....	Laura Cecil.....		
McLaughlin Bros., Columbus, O.....			
J. H. Walker Plain City, O.....			
C. W. Mark, Washington C. H., O.....			
H. F. Wilson, Chillicothe, O.....	Charley.....	First	10 00
<i>Single horse, driven by a lady.</i>			
Mrs. C. M. Ball, So. Charleston, O.....	John L.....	First	5 00
S. H. Turner, Columbus, O.....	Hiaway		
C. W. Mark, Washington C. H., O.....			
<i>Double team driven by a lady.</i>			
Mrs. C. M. Ball, So. Charleston, O.....	John L. and Young Traveler.	First	8 00
I. S. Keeton, Lattas, O.....			
S. H. Turner, Columbus, O.....			

F. A. Johnston and Chas. Woodward, Perintown, O., *Expert Judges.*

SADDLE HORSES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion for saddle.</i>			
E. L. McCollem, Columbus, O.....	Denmark	First	\$10 00
<i>Mare or gelding.</i>			
E. L. McCollem, Columbus, O.....	Fannie P.....		
Same	Fox	Second	5 00
Same	Harry		
A. H. Andrews, Columbus, O.....	Colonel A.....	Third	
W. I. Wood, Williamsport, O.....	Roan Gelding.....		
Edw. Johnson, Columbus, O.....	Duke Denmark.....	First	10 00
<i>Horse, mare or gelding showing combined harness and saddle gait.</i>			
E. L. McCollem, Columbus, O.....	Fox	First	10 00
Same	Harry		
Edw. Johnson, Columbus, O.....	Duke Denmark	Second	5 00
<i>Special class—High school horse.</i>			
E. L. McCollem, Columbus, O.....	Fox	Third	
Same	Fannie P.....	First	10 00
A. H. Andrews, Columbus, O.....	Colonel H.....		

Chas. Woodward, Perintown, O., *Expert Judge.*

SHETLAND PONIES AND PONY TURNOUTS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion 3 years old and over.</i>			
W. J. Stout, Columbus, O.....	Queety.....		
Jane M. Doren, Columbus, O.....	Stiletto.....	Second.	\$ 8 00
Same.....	Prince.....		
Same.....	Tom Thumb.....		
Cobb Gavitt, Ashley, O.....	Ben.....		
Same.....	John.....		
W. J. Sampson, Youngstown, O.....		First.....	15 00
Same.....			
W. H. Lucas, Outville, O.....	Bally Tom.....	Third.....	
<i>Stallion 2 years old and under 3.</i>			
Jane M. Doren, Columbus, O.....	Mac Duff.....	Third.....	
Frank Orr, Columbus, O.....	Robert.....		
Cobb Gavitt, Ashley, O.....	Tom.....	Second.	5 00
Same.....	Jerry.....		
W. J. Sampson, Youngstown, O.....			
W. H. Lucas, Outville, O.....	Phil.....	First.....	10 00
<i>Stallion 1 year old and under 2.</i>			
Jane M. Doren, Columbus, O.....	Fleetwood.....		
Cobb Gavitt, Ashley, O.....	Billy.....	First.....	5 00
W. J. Sampson, Youngstown, O.....		Second.....	3 00
Same.....		Third.....	
<i>Stallion under 1 year old.</i>			
Jane M. Doren, Columbus, O.....	Wee Laddee.....		
Same.....	Sir Kenneth.....	Second.	2 00
Cobb Gavitt, Ashley, O.....	Bob.....	Third.....	
W. J. Sampson, Youngstown, O.....		First.....	3 00
Same.....			
<i>Herd of Seven Head.</i>			
Jane M. Doren, Columbus, O.....		Second.	8 00
Cobb Gavitt, Ashley, O.....		First.....	15 00
Same.....		Third.....	
W. J. Sampson, Youngstown, O.....			
Same.....			
W. H. Lucas, Outville, O.....			
<i>Mare 3 years old and over.</i>			
Jane M. Doren, Columbus, O.....	Tabby.....	Second.	5 00
Same.....	Lula.....	Third.....	
Same.....	Floss.....		
Cobb Gavitt, Ashley, O.....	Topsy.....	First.....	10 00
Same.....	Daisy.....		
W. J. Sampson, Youngstown, O.....			
Same.....			
W. H. Lucas, Outville, O.....	Lillie.....		
<i>Mare 2 years old and under 3.</i>			
Jane M. Doren, Columbus, O.....	Princes Dollalolla.....	Third.....	
Cobb Gavitt, Ashley, O.....	Kate.....	First.....	10 00
Same.....	Susie.....		
W. J. Sampson, Youngstown, O.....		Second.	5 00
Same.....			
W. H. Lucas, Outville, O.....	Spot.....		
<i>Filly 1 year old and under 2.</i>			
Jane M. Doren, Columbus, O.....	Lorna Doone.....	Third.....	
Cobb Gavitt, Ashley, O.....	Bang.....	First.....	5 00
Same.....	Pearl.....	Second.	3 00
W. J. Sampson, Youngstown, O.....			
<i>Filly under 1 year old.</i>			
Jane M. Doren, Columbus, O.....	Toots.....		
Cobb Gavitt, Ashley, O.....	Baby.....	First.....	3 00
W. J. Sampson, Youngstown, O.....		Second.	2 00
Same.....		Third.....	

SHETLAND PONIES AND PONY TURNOUTS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Single turnout.</i>			
E. L. McCollem, Columbus, O.....	Dan.....		
S. B. Hartman, Columbus, O.....	Roilette.....		
J. W. Stout, Columbus, O.....	Geo. Washington.....		
R. D. Bohannon, Columbus, O.....	Tommie.....	Second.	\$5 00
Beal and Moore, Columbus, O.....			
Cobb Gavitt, Ashley, O.....			
W. J. Sampson, Youngstown, O.....		Third.	
W. H. Lucas, Outville, O.....		First.....	10 00
<i>Double turnout.</i>			
Jane M. Doren, Columbus, O.....		Second.	\$8 00
Cobb Gavitt, Ashley, O.....		Third.....	
Same.....			
W. J. Sampson, Youngstown, O.....			
W. H. Lucas, Outville, O.....		First.....	15 00

Chas. Woodward, Perintown, O., *Expert Judge.*

SWEEPSTAKES FOR COACH HORSES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Coach stallion of any age.</i>			
McLaughlin Bros., Columbus, O.....	Chilon.....	First.....	\$15 00
Same.....	Fumet.....		
Plain City Horse Co., Plain City, O.....	Agobard.....		

M. H. Miller, *Expert Judge.*

SWEEPSTAKES, FRENCH AND BELGIAN DRAFT.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion with four of his colts.</i>			
Blanqui Horse Co., Plain City, O.....	Blanqui.....	First.....	\$25 00
<i>Stallion of any age.</i>			
Jules Guilanmin, Grosse Isle, Mich.....	Mon Voison.....	First.....	15 00
Blanqui Horse Co., Plain City O.....	Blanqui.....		
C. M. Jones, Plain City O.....	Moreri.....		
McLaughlin Bros., Columbus, O.....	Rai.....		
Same.....	Jaures.....		
<i>Mare of any age.</i>			
A. J. Torbert, Plain City, O.....		First.....	15 00

M. H. Miller, *Expert Judge.*

ACRICULTURAL REPORT.

SWEEPSTAKES FOR SHIRES AND CLYDESDALES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion of any age.</i>			
J. Luther, Ropp, Marey, O.....	Ferdinand	First.....	\$15 00

M. H. Miller, *Expert Judge.*

SWEEPSTAKES FOR ROADSTERS—STANDARD BRED.

Owner's Name and Post-office	Name of Animal.	Premium.	Amount.
<i>Stallion with four of his colts.</i>			
Woodside Stock Farm, Middletown, O.....	Col Bullitt.....		
J. W. Rothrock, Washington C. H.....	Bobby Burns.....	First.....	25 00
<i>Stallion of any age.</i>			
J. A. Hall, Columbus, O	Geo. T. Putnam.....		
Farris Egolf, Etna, O.....	Gen McKinley.....		
J. A. Bell & Son, Ashley, O.....			
Woodside Stock Farm, Middletown, O.....	Col. Bullitt.....	First.....	15 00
F. C. Lampe, Jeffersonville, O.....			
Same.			
H. W. Cookston, Cochranton, O.....			
S. W. Blackwood, Lithopolis, O.....	Charlie Cecil		
A. R. Miller, Pataskala, O.....			
<i>Mare of any age.</i>			
J. A. Hall, Columbus, O.....	Hanarinda	First ...	15 00
S. H. Turner, Columbus, O.....	Anisetta.....		
F. C. Lampe, Jeffersonville, O			
E. Steen, Washington, C. H., O.....	Ethal Burns		

C. H. Ganson, V. J. Craig, M. H. Miller, *Expert Judges.*

SWEEPSTAKES FOR ROADSTERS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Stallion with four of his colts.</i>			
B. F. Parcell & Son, Reynoldsburg, O.....	Columbus Wilkes	First	25 00
T. Shallenberger & Co., Amanda, O.....	Fairfield Boy		
<i>Stallion of any age.</i>			
Daniel Hickman, Reynoldsburg, O	Truro Wilkes.....	First.....	15 00
McLaughlin Bros., Columbus, O.....	Bayard Morgan		
<i>Mare of any age.</i>			
D Westwater, Columbus, O.....	Mary Lee.....	First	15 00

C. H. Ganson, M. H. Miller, V. D. Craig, *Expert Judges.*

SUMMARY OF THE RACES.

TWO-YEAR-OLD TROT OR PACE.

Entered by	Name of Animal.	Heats.		
C. W. Greeno, Gallatin, Tenn.....	s. m. Sweet Fern.....	4	3	4
J. T. Deardoff, Lebanon, Ohio.....	b. f. Arbor Day.....	3	4	3
Sherman Hunee, Columbus, Ohio.....	b. f. Lady Bashford.....	1	1	1
R. B. Willis, Broadway, Ohio.....	—m. Pansy B.....	2	2	2

Time ($\frac{1}{2}$ mile)—1:13 $\frac{1}{2}$, 1:13 $\frac{1}{2}$, 1:15.

THREE-YEAR OLD PACERS.

Entered by	Name of Animal.	Heats.		
D. N. Smithers, Washington C. H., Ohio.....	g. m. Mamie A.....	1	1	1
Phil Manges, Pataskala, Ohio.....	blk. f. Miss Ruth.....	4	4	4
C. E. Leist, Columbus, Ohio.....	b. m. Mable B.....	3	3	2
R. B. Gallogby, Newark, Ohio.....	ch. g. Burr Patch.....	2	2	3
Wm. McCurdy, Marion, Ohio.....	b. s. Robetta.....	5	5	5

Time—2:29 $\frac{1}{4}$, 2:29 $\frac{1}{2}$, 2:29 $\frac{1}{4}$.

2:22 CLASS—TROTTERS.

Entered by	Name of Animal.	Heats.		
Foster Webb, Riley, Ohio.....	Pantheon B.....	1	1	1
Crain & Powell, Urbana, Ohio.....	blk. — Espy Boy.....	4	3	2
L. Haynes, Chillicothe, Ohio.....	b. g. Charlie G.....	2	6	8
L. Hathaway, Middletown, Ohio.....	br. s. Redway.....	5	8	6
O. Whitson, New Burlington, Ohio.....	s. s. Edgar.....	8	4	4
H. W. Tapp, Fort Wayne, Ind.....	b. s. Wayne Chief.....	6	5	5
W. E. Ingraham, Greenville, Ohio.....	ch. s. Capt. Hallett.....	3	2	3
Page Bros., Felicity, Ohio.....	b. h. Jimmy Hopkins.....	7	7	7

Time—2:20 $\frac{1}{2}$, 2:22 $\frac{1}{4}$, 2:21 $\frac{3}{4}$.

2:20 CLASS—PACING.

Entered by	Name of Animal.	Heats.		
John Allen, Royalton, Ohio.....	b. s. Reavis.....	11	14	Dr.
Arthur Edwards, Jeffersonville, Ohio.....	b. g. Dictum.....	10	8	10
T. J. Burgett, Mt. Sterling, Ohio.....	b. s. Mackie Wood.....	6	7	7
J. E. Green, Washington C. H., Ohio.....	Merry-Go-Round.....	8	10	8
W. B. Bryson, Xenia, Ohio.....	blk. h. Wilmons.....	9	3	5
Perry Bros., Howard, Ohio.....	s. g. Jack.....	2	6	4
J. B. Buckland, Chillicothe, Ohio.....	br. m. Dakota.....	13	11	11
J. H. Marshall, Waynesville, Ohio.....	s. g. Broker.....	1	1	1
Jonathan Hay, Ashville, Ohio.....	rn. s. Arabian Wilkes.....	12	9	12
R. F. Myers, Dayton, Ohio.....	b. s. Venture.....	14	2	13
J. R. Steen, Wilmington, Ohio.....	g. m. Bettie Irvin.....	7	12	6
O. A. Diver, Prairie Depot, Ohio.....	rn. m. Laura N.....	3	13	3
W. N. Albin, Springfield, Ohio.....	b. m. Helen P.....	5	5	9
John Snobarger, Goshen, Ind.....	b. c. Decoy.....	4	4	2

Time—2:18 $\frac{1}{4}$, 2:16 $\frac{1}{2}$, 2:17 $\frac{1}{4}$.

AGRICULTURAL REPORT.

2:33 CLASS TROTTERS.

Entered by	Name of Animal.	Heat.		
Wm. Herron, Wyoming, O.....	blk. m. Emma T.....	4	6	Dis.
E. C. Pockock, Coshocton, O.....	b. s. Lord Harcourt.....	3	7	6
John Splan, Glenville, O.....	b. g. Alcoran.....	5	2	2
Frank Cone, Radnor, O.....	b. h. Barrow Welsh.....	8	5	Dis.
R. O. Haggerty, Elkhart Ind.....	b. g. Monte Christo.....	6	8	4
Joe Hand, Covington, Ky.....	b. m. Nellie H.....	2	4	5
G. B. Davidson, Norwalk, O.....	b. g. Jim Corbett.....	9	9	Dr.
Geo. W. Crawford, Newark, O.....	blk. s. Baronaise.....	1	1	1
A. R. Miller, Pataskala, O.....	b. h. Zelora.....	7	3	3

Time—2:22¼; 2:20¼; 2:21.

2:27 CLASS TROTTERS.

Entered by	Name of Animal.	Heat.		
John Splan, Glenville, O.....	b. s. Jack Dawson.....	1	1	1
Edw. Snyder, Delaware, O.....	b. s. Esparta Rex.....	3	3	6
Rundle Stock Farm.....	blk. m. Louise.....	9	6	Dis.
H. J. Jarvis, Kilbourne, O.....	b. c. Billie Russell.....	7	4	Dis.
Dr. A. L. Jackson, Zanesville, O.....	b. g. Onway.....	10	10	7
Wess Miller, Waldo, O.....	b. g. Jack Spratt.....	2	2	3
W. B. Bryson, Xenia, O.....	b. h. Advance.....	5	8	2
F. Reichroth, Cincinnati, O.....	b. g. Rocksie.....	8	7	5
J. W. Townsley, Jamestown, O.....	b. s. Royalwood.....	4	5	Dis.
O. S. Jones, Columbus, O.....	b. m. Maggie C.....	6	9	4
Wm. McCurdy, Marion, O.....	b. m. Clatie Wilkes.....	11	11	8

Time—2:26½; 2:25¼; 2:26¾.

2:30 CLASS PACING.

Entered by	Name of Animal.	Heat.		
A. A. French, Columbus, O.....	b. m. Bowery Girl.....	2	8	8
J. R. Brown, Columbus, O.....	s. h. Hercules, Jr.....	Dis.		
Geo. Barnes, Coshocton, O.....	b. h. Harry T.....	3	2	7
D. M. Simpson, Delaware, O.....	b. m. Atlanta B.....	6	6	6
Wm. McCurdy, Marion, O.....	spot. m. Snowflake.....	Dis.		
Maple Leaf Stock Farm, So. Charleston, O.....	g. m. Bessie Bonehill.....	4	5	5
G. W. Crawford, Newark, O.....	s. m. Baby Ruth.....	Dis.		
V. R. McCoy, Austin, O.....	br. f. Bernice.....	5	4	2
E. Steen, Washington C. H., O.....	b. s. Jim Kennedy.....	Dis.		
P. J. Curran, Sabina, O.....	b. m. Clashmore.....	8	7	4
Jerre A. Jones, Circleville, O.....	b. m. Daisy J.....	1	1	1
J. S. Smith, Circleville, O.....	g. g. Sunnyside.....	Dis.		
W. T. Mayers, Howard, O.....	rn. s. Jimmie Porter.....	Dis.		
Dr. A. L. Jackson, Zanesville, O.....	b. m. Maud L.....	7	3	3

Time—2:20¼; 2:20¼; 2:21½.

2:18 CLASS TROTTERS.

Entered by	Name of Animal.	Heat.		
H. C. Liler, Berry, Ky.....	b. lack Storm.....	3	2	5 5 3
Thomas Price, Lexington, Ky.....	b. m. A vana.....	1	1	2 2 1
E. J. Merkle, Columbus, O.....	b. g. Proctor W.....	4	4	3 3 5
Geo. W. Jameson, Delaware, O.....	Black Raven.....	5	5	4 4 4
R. J. Evans, Greenville, O.....	b. h. Jockton.....	2	3	1 1 2

Time—2:20; 2:21; 2:22½; 2:23; 2:23.

2:40 CLASS TROTTERS

Entered by	Name of Animal.	Heats.
John Splan, Glenville, O.....	b. g. Aleoran.....	6 4 1 1 1
Miles and Horton, Goshen Ind.....	g. f. Campana Girl	1 1 6 3 6
G. W. Crawford, Newark, O.....	blk. s. Baronise.....	3 5 7 6 2
J. M. Adams, Coshocton, O.....	Grace Foster	8 2 4 4 5
Wm. Herron, Wyoming, O.....	b. m. Belle H.....	2 8 11 8 Dr.
C. E. Gunder, Richwood, O.....	b. m. Zipp.....	5 9 9 Dr.
Z. T. Sturgeon, Lancaster, O.....	ch. g. Karl.....	7 7 5 5 3
Michael Kearns, Springfield, O.....	Besse K.....	4 10 8 Dr.
S. J. Beebe, Columbus, O.....	rn. g. S. B.....	10 3 3 7 7
George Byers, Mt. Sterling, O.....	Chillicothe Girl.....	9 6 2 2 4
J. H. Walker, Plain City, O.....	Nellie G.....	11 11 10 9 Dr

Time—2:30, 2:28¼, 2:26½, 2:26½, 2:26½.

HURDLE RACE—MILE DASH.

Entered by	Name of Animal.	Heats.
N. Ackerman, Columbus, O.....	Lord Russell.....	1
John Thomas, New York City, N. Y.....	s. g. Stretch Runner.....	2
S. D. Robinson, Ironton, O.....	br. g. Sir Franklin.....	Dis.

Time—2:03

HURDLE RACE—MILE DASH.

Entered by	Name of Animal.	Heats.
James Shy, Covington, Ky.....	Vesper.....	Dis
N. Ackerman, Columbus, O.....	Lord Russell.....	1
James Thomas, New York City, N. Y.....	s. g. Stretch Runner.....	Dis.

Time—2:23½.

RUNNING ONE MILE DASH.

Entered by	Name of Animal.	Heats.
Campbell & Kent, Marion, O.....	Darius.....	2
W. G. Matthews, Homer, O.....	b. g. McDonald.....	1
J. Earp, Bowling Green, O.....	Duce.....	4
G. H. Scranton, Columbus, O.....	Ida C.....	3

Time—1:47

RUNNING ONE MILE DASH.

Entered by	Name of Animal.	Heats.
W. G. Matthews, Homer, O.....	McDonald.....	1
James Thomas, New York City, N. Y.....	s. g. Stretch Runner.....	2
T. Drake, Newport, Ky.....	On foot.....	3
Campbell & Kent, Marion, O.....	Darius.....	—

Time—1:55¼.

RUNNING—ONE-HALF MILE HEATS, BEST 2 IN 3.

Entered by	Name of Animal.	Heats.
McLaan & Wendel.....	g. Shawnee.....	3 6
Thomas Horan.....	gr. m. Jennie West.....	2 4
Reub Fronefried, Van Wert, Ohio.....	s. s. Fauslight.....	1 1
P. T. Chek, Covington, Ky.....	Trilby Slippers.....	6 3
Balsinger Bros., Marion, Ohio.....	b. g. Marion Star.....	4 2
S. D. Robinson, Ironton, Ohio.....	br. g. Sir Franklin.....	5 5

Time—.51, .51½.

RUNNING—ONE MILE DASH,

Entered by	Name of Animal.	Heats.
Campbell & Kent, Marion, Ohio.....	b. g. Darius.....	2
Geo H. Scranton, Columbus, Ohio.....	Ida C.....	3
John Thomas, New York City, N. Y.....	Stretch Runner.....	1

Time—1.47¼.

RUNNING—ONE-HALF MILE HEATS, BEST 2 IN 3.

Entered by	Name of Animal	Heats.
Balsinger Bros., Marion, Ohio.....	b. g. Marion Star.....	1 1
G. W. Henry, Washington, Ind.....	Mary Lou.....	4
Reub Fronefried, Van Wert, Ohio.....	Fauslight.....	2 2
McLane & Wendel.....	Shawnee.....	3 3

Time—.53½, .53.

CONSOLATION RACE—ONE MILE DASH.

Entered by	Name of Animal.	Heats.
J. Ea. v, Bowling Green, Ohio.....	Duce.....	4
G. H. Scranton, Columbus, O.....	Ida C.....	2
P. T. Chek, Covington, Ky.....	Trilby Slippers.....	3
G. W. Henry, Washington, Ind.....	Mary Lou.....	5
Campbell & Kent, Marion, Ohio.....	Darius.....	1

Time—1.49¼.

RUNNING TO HARNESS—MILE DASH.

Entered by	Name of Animal.	Heats.
Tom Purdum, Newport, Ky.....	Onfoot.....	1
Johr Splan, Glenville, Ohio.....	Lucifer.....	2
Ed Dandridge, Cleveland, Ohio.....	b. g. Ballard Boy.....	2

Time—2.23¼.

HANDICAP—MILE DASH.

Entered by	Name of Animal.	Heats.
Reub Fronefried, Van Wert, Ohio.....	Fauslight	2
W. G. Matthews, Homer, Ohio.....	McDonald.....	1
John Thomas, New York City, N. Y	Stretch Runner.....	3

Time—1.50.

CATTLE—L. G. ELY, Member in Charge.

SHORTHORNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull three years old and over.</i>			
N. S. McKay and W. T. Poague, Xenia, O.	Valasco 2d.	Second.	\$10 00
J. A. Gerlaugh, Harshman, O.	Scottish King .....	.....	.....
Kellogg Stock Farm Co., Claridon, O.	Baron Lavender .....	.....	.....
W. I. Wood, Williamsport, O.	Woodland Commander 2d .....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Royal Hero.	First	20 00
D. W. Evans, Venedocia, O.	Hero Knight	Third .....	.....
<i>Bull two years old and under three.</i>			
W. I. Wood, Williamsport, O.	Forest Chief	Second.	10 00
D. W. Evans, Venedocia, O.	Athelstane 4th	First	20 00
<i>Bull one year old and under two.</i>			
W. I. Wood, Williamsport, O.	Bell Commander	Second.	5 00
W. T. Miller & Son, Carlos, Ind.	Cronder	First	10 00
<i>Bull calf.</i>			
J. A. Gerlaugh, Harshman, O.	Chiefman	Second.	5 00
Same	Clansman .....	.....	.....
Kellogg Stock Farm Co., Claridon, O. ....	.....	First	10 00
Same .....	.....	.....	.....
W. I. Wood, Williamsport, O.	Baby Chief .....	.....	.....
Same	Star Commander .....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Samuel .....	.....	.....
D. W. Evans, Venedocia, O. ....	.....	Third .....	.....
<i>Cow three years old and over.</i>			
J. A. Gerlaugh, Harshman, O.	Cameo .....	.....	.....
Kellogg Stock Farm Co., Claridon, O.	Oakland Lady 6th	Third .....	.....
Same	Cherry Knight 18th .....	.....	.....
Same	Secret Sousie .....	.....	.....
W. I. Wood, Williamsport, O.	Lady Lake 2d .....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Mary Abbottsburn 6th	Second.	10 00
Same	Rosalina 4th	First	15 00
D. W. Evans, Venedocia, O.	Silver Flower .....	.....	.....
<i>Cow or heifer two years old and under three.</i>			
J. A. Gerlaugh, Harshman, O.	Columbia	Third .....	.....
Kellogg Stock Farm Co., Claridon, O.	Nannie Ruby .....	.....	.....
Same	Stella 2d .....	.....	.....
W. I. Wood, Williamsport, O. ....	.....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Creseda of Clover Leaf	First	10 00
D. W. Evans, Venedocia, O. ....	.....	Second.	5 00
<i>Heifer one year old and under two.</i>			
J. A. Gerlaugh, Harshman, O.	Golden Drop .....	.....	.....
Same	Coropsis .....	.....	.....
Kellogg Stock Farm Co., Claridon, O.	Oakland Lady 8th .....	.....	.....
Same	Stella 3d .....	.....	.....
W. I. Wood, Williamsport, O.	Woodland Belle 7th .....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Eldora of Ashburn	Third .....	.....
Same	Hattie of Ashburn	First	10 00
D. W. Evans, Venedocia, O.	Red Lady	Second.	5 00
<i>Heifer calf.</i>			
J. A. Gerlaugh, Harshman, O.	Ensign	Third .....	.....
Same	Gem of Auvern	First	10 00
Kellogg Stock Farm Co., Claridon, O.	Secret Sousie 2d .....	.....	.....
W. I. Wood, Williamsport, O.	Abbottsburns' Champ'n Mary .....	.....	.....
Same	May Chief .....	.....	.....
W. T. Miller & Son, Carlos, Ind.	Sallie Girl
Same	Mary B
D. W. Evans, Venedocia, O.	Etta 2d	Second	5 00

ENTRIES AND AWARDS.

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SWEEPSTAKES.

Owners's Name and Postoffice.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERDS.			
<i>Bull and graded herd.</i>			
J. A. Gerlaugh, Harshman, O.....
Kellogg Stock Farm Co., Claridon, O.....
W. T. Miller and Son, Carlos, Ind.....	First.....	\$40 00
D. W. Evans, Venedocia, O.....
BREEDERS' HERDS			
<i>Young herd.</i>			
J. A. Gerlaugh, Harshman, O.....
Kellogg Stock Farm Co., Claridon, O.....
W. T. Miller & Son, Carlos, Ind.....	First.....	40 00
D. W. Evans, Venedocia, O.....
<i>Four animals of either sex.</i>			
J. A. Gerlaugh, Harshman, O.....
Kellogg Stock Farm Co., Claridon, O.....
W. T. Miller & Son, Carlos, Ind.....	First.....	30 00
D. W. Evans, Venedocia, O.....

DEVONS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bulls three years old and over.</i>			
D. J. Whitmore, Casstown, O.....	First.....	20 00
<i>Bulls two years old and under three.</i>			
D. J. Whitmore, Casstown, O.....	First.....	20 00
<i>Bull one year old and under two.</i>			
D. J. Whitmore, Casstown, O.....	First.....	10 00
<i>Bull calf.</i>			
D. J. Whitmore, Casstown, O.....	First.....	10 00
Same.....	Second.....	5 00
<i>Cow three years old and over.</i>			
D. J. Whitmore, Casstown, O.....	First.....	15 00
Same.....	Second.....	10 00
<i>Cow or heifer two years old and under three.</i>			
D. J. Whitmore, Casstown, O.....	First.....	10 00
Same.....	Second.....	5 00
<i>Heifer one year old under two.</i>			
D. J. Whitmore, Casstown, O.....	First.....	10 00
Same.....	Second.....	5 00
<i>Heifer calf.</i>			
D. J. Whitmore, Casstown, O.....	First.....	10 00
Same.....	Second.....	5 00

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITOR'S HERD.			
<i>Bull and Graded Herd.</i>			
D. J. Whitmore, Casstown, Ohio	First.....	\$ 40 00
BREEDER'S HERD.			
<i>Young Herd.</i>			
D. J. Whitmore, Casstown, O.....	First.....	40 00
<i>Four Animals of either sex.</i>			
D. J. Whitmore, Casstown, O.....	First.....	30 00

N. W. Baker, *Expert Judge.*

HEREFORDS.

Owner's Name and Post-office.	Name of Animal	Premium	Amount.
<i>Bull 3 years old and over</i>			
Thos. Clark, Beecher, Ill.....	Lars.....	First.....	\$ 20 00
G. W. Harness, Galveston, Ind.....	Earl of Shadeland.....	.....	.....
Same.....	Pride of Evergreen.....	.....	.....
Clem Graves, Bunker Hill, Ind.....	.....	Second.....	10 00
Thos. W. Herron, Freeland, O.....	Actor.....	Third.....	.....
<i>Bull 2 years old and under 3.</i>			
John Hooker, New London, O.....	Java.....	First.....	20 00
G. W. Harness, Galveston, Ind.....	Gay Lad.....	Third.....	.....
Clem Graves, Bunker Hill, Ind.....	.....	Second.....	10 00
<i>Bull 1 year old and under 2.</i>			
Thos. Clark, Beecher, Ill.....	Littleton.....	First.....	10 00
G. W. Harness, Galveston, Ind.....	Thanksgiving.....	Second.....	5 00
Clem Graves, Bunker Hill, Ind.....	.....	.....	.....
Same.....	.....	.....	.....
W. G. Crawford & Son, Rix Mills, O.....	McKinley.....	Third.....	.....
<i>Bull calf.</i>			
John Hooker, New London, O.....	Bill Van Netta.....	.....	.....
Thos. Clark, Beecher, Ill.....	Peerless Wilton 29th.....	Second.....	5 00
G. W. Harness, Galveston, Ind.....	John Carlisle.....	.....	.....
Same.....	John Sherman.....	.....	.....
Clem Graves, Bunker Hill, Ind.....	.....	.....	.....
Same.....	.....	First.....	10 00
W. G. Crawford & Son, Rix Mills, O.....	Bushnell.....	.....	.....
Thos W. Herron, Freeland, O.....	Kodak.....	Third.....	.....
<i>Cow 3 years old and over.</i>			
John Hooker, New London, O.....	Miss Clark.....	.....	.....
Thos. Clark, Beecher, Ill.....	Juvenile.....	First.....	15 00
G. W. Harness, Galveston, Ind.....	Pet.....	Third.....	.....
Same.....	Jessie.....	.....	.....
Clem Graves, Bunker Hill, Ind.....	.....	.....	.....
Same.....	.....	.....	.....
W. G. Crawford & Son, Rix Mills, O.....	Ruby 2d.....	.....	.....
Thos. W. Herron, Freeland, O.....	Millie of Rockland.....	Second.....	10 00

ENTRIES AND AWARDS.

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HEREFORDS - Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Cow or heifer 2 years old and under 3.</i>			
John Hooker, New London, O	Dolly 3d.....		
Thos. Clark, Beecher, Ill.....	Jessamine	First	\$10 00
Same	Purity	Second.....	5 00
G. W. Harness, Galveston, Ind.....	Lenna Honey.....		
Same	Lady Fay.....	Third.....	
Clem Graves, Bunker Hill, Ind.....			
Same			
W. G. Crawford & Son, Rix Mills, O.....	Princess		
Thos. W. Herron, Freeland, O.....	Doreas.....		
<i>Heifer 1 year old and under 2.</i>			
John Hooker, New London, O.....	Dolly 4th.....		
Thos. Clark, Beecher, Ill.....	Juno	First	10 00
Same	Adorable	Second.....	5 00
G. W. Harness, Galveston, Ind.....	Ruth		
Same	Maude		
Clem Graves, Bunker Hill, Ind.....			
Same			
Thos. W. Herron, Freeland, O.....	Florence.....		
Same	Duchess.....	Third.....	
<i>Heifer calf.</i>			
John Hooker, New London, O	Dolly 5th.....	Third.....	
Thos. Clark, Beecher, Ill.....	Perfect	First	10 00
Same	Elegant	Second.....	5 00
G. W. Harness, Galveston, Ind.....	Lady Gail.....		
Same	Laura Belle.....		
Clem Graves, Bunker Hill, Ind.....			
Same			
W. G. Crawford & Son, Rix Mills, O.....	Actress		
Thos. W. Herron, Freeland, O.....	Millie.....		

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITERS' HERD.			
<i>Bull and graded herd.</i>			
John Hooker, New London, O			
Thos. Clark, Beecher, Ill.....		First	\$40 00
G. W. Harness, Galveston, Ind.....			
Clem Graves, Bunker Hill, Ind.....			
Thos. W. Herron, Freeland, O			
BREEDERS' HERDS.			
<i>Young herd.</i>			
Thos. Clark, Beecher, Ill.....		First	40 00
G. W. Harness, Galveston, Ind.....			
Clem Graves, Bunker Hill, Ind.....			
Thos. W. Herron, Freeland, O			
<i>Four animals of either sex.</i>			
Thos. Clark, Beecher, Ill.....		First	30 00
G. W. Harness, Galveston, Ind.....			
Clem Graves, Bunker Hill, Ind.....			
Thos. W. Herron, Freeland, O			

N. W. Baker, *Expert Judge.*

JERSEYS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
Miller & Sibley, Franklin, Pa.....	Major Appel Pogis.....	First.....	\$ 20 00
A. S. Bell, London, O.....	Fancy Harry 6th.....	Second.....	10 00
Mrs. A. M. Hallock, Columbus, O.....	Nestor of St. Lambert.....	Third.....	
Same.....	Poet's Dream of St. Lambert.....		
Miller & Sibley, Franklin, Pa.....	St. Pogis of New Castle.....		
<i>Bull 2 years old and under 3.</i>			
James R. Orr, Cedarville, O.....	Pride.....	Second.....	10 00
A. S. Bell, London, O.....	Silver Sheens King.....	First.....	20 00
Mrs. A. Hallock, Columbus, O.....		Third.....	
<i>Bull 1 year old and under 2.</i>			
James R. Orr, Cedarville, O.....	Butterworth.....	Third.....	
Miller & Sibley, Franklin, Pa.....	Ida's Rioter of St. L. 14th.....	Second.....	5 00
Same.....	St. Lambert of Prospect.....	First.....	10 00
A. S. Bell, London, O.....	Fancep's Vulcan.....		
Mrs. A. M. Hallock, Columbus, O.....	Nestor of St. Lambert 12th.....		
Same.....	Walker's St. Lambert.....		
<i>Bull calf.</i>			
James R. Orr, Cedarville, O.....	Sir Combination Pogis.....	First.....	10 00
Miller & Sibley, Franklin, Pa.....	Ida's Rioter of St. L. 20th.....	Second.....	5 00
Same.....		Third.....	
A. S. Bell, London, O.....	Nestor of St. Lambert 14th.....		
Mrs. A. M. Hallock, Columbus, O.....	Poet's Fortune.....		
Same.....	Poet's Promise.....		
Same.....			
<i>Cow 3 years old and over.</i>			
Miller & Sibley, Franklin, Pa.....	Hugos Lass.....	First.....	15 00
Same.....	Kaffies Rosabelle 2d.....	Third.....	
A. S. Bell, London, O.....	May Sadie.....		
Same.....	Dubenna 2d.....	Second.....	10 00
Mrs. A. M. Hallock, Columbus, O.....	Nestor's Beauty of St. L.....		
Same.....	Rowena of St. Lambert.....		
Same.....	Elinor Wells 2d.....		
<i>Cow or heifer 2 years old and under 3.</i>			
Jamns R. Orr, Cedarville, O.....	Rena.....		
Miller and Sibley, Franklin, Pa.....	Censor.....	First.....	10 00
Same.....	Pedigree.....	Second.....	5 00
A. S. Bell, London, O.....	May Sadie's Fancy.....	Third.....	
Mrs. A. M. Hallock, Columbus, O.....	Poppy of St. Lambert.....		
Same.....	Nestor's Lady Woodbine.....		
Same.....	Meridale Kitty.....		
<i>Heifer 1 year old and under 2.</i>			
James R. Orr, Cedarville, O.....	Sparkle.....		
Miller & Sibley, Franklin, Pa.....	Crosier.....	First.....	10 00
Same.....	Chopsticks.....	Second.....	5 00
A. S. Bell, London, O.....	Panaches Fancy.....		
Mrs. A. M. Hallock, Columbus, O.....	Signal Lily Flower.....	Third.....	
Same.....	Rowena of St. Lambert 2d.....		
Same.....	Exiles Golden Hope.....		
Same.....	Sweet Clover Blossom.....		
James R. Orr, Cedarville, O.....	Goldie.....		
<i>Heifer calf.</i>			
James R. Orr, Cedarville, O.....		Second.....	5 00
Miller & Sibley, Franklin, Pa.....		First.....	10 00
Same.....		Third.....	
A. S. Bell, London, O.....			
Same.....			
Mrs. A. M. Hallock, Columbus, O.....	Poet's Goddess of Beauty.....		
Same.....	Exiles Lady Star 2d.....		
Same.....	St. Lambert's Pride 3d.....		

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERD.			
<i>Bull and graded herd.</i>			
Miller & Sibley, Franklin, Pa.....		First	\$40 00
A. S. Bell, London, O.....			
Mrs. A. M. Hallock, Columbus, O.....			
BREEDERS' HERDS.			
<i>Young herd.</i>			
James R. Orr, Cedarville, O.....			
Miller & Sibley, Franklin, Pa.....		First	40 00
A. S. Bell, London, O.....			
Mrs. A. M. Hallock, Columbus, O.....			
<i>Four animals of either sex.</i>			
James R. Orr, Cedarville, O.....			
Miller & Sibley, Franklin, Pa.....		First	30 00
A. S. Bell, London, O.....			
Mrs. A. M. Hallock, Columbus, O.....			

Thomas F. Hunt, *Expert Judge.*

GUERNSEYS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
Jos. Defrees, Piqua, O.....	Delegate.....	First	\$20 00
<i>Bull 2 years old and under 3.</i>			
McCormick & Edgerly, Pataskala, O.....	Beth Avon.....	First	20 00
<i>Bull calf.</i>			
Jos. Defrees, Piqua, O.....	Tammany.....	First	10 00
McCormick & Edgerly, Pataskala, O.....	Oshorn	Second.	5 00
Same	Beth Rose.....	Third	
Same	Prince Roy.....		
<i>Cow 3 years old and over.</i>			
Jos. Defrees, Piqua, O.....	Lady des Bean Camp's 2d.....	First	15 00
Same	Miss Vanity.....	Third	
McCormick & Edgerly, Pataskala, O.....		Second.	10 00
Same	Prince Anna.....		
<i>Cow or heifer 2 years old and under 3.</i>			
Jos. Defrees, Piqua, O.....	Telba	Second.	5 00
McCormick & Edgerly, Pataskala, O.....	Miami Rose	First.....	10 00
Same	Minnie.....	Third.....	
<i>Heifer 1 year old and under 2.</i>			
Jos. Defrees, Piqua, O.....	Beauty of Round Rock.....	Second.	5 00
Same	Helms' New Year's Gift.....	Third	
McCormick & Edgerly, Pataskala, O.....	Hazel Prince.....	First.....	10 00
<i>Heifer calf.</i>			
Jos. Defrees, Piqua, O.....	Round Rock's Phœbe	First.....	10 00
McCormick & Edgerly, Pataskala, O.....	Roxanna.....	Second.	5 00

AGRICULTURAL REPORT.

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERD.			
<i>Bull and graded herd.</i>			
Jos. Defrees, Piqua, O.....	First	\$40 00
McComaick & Edgerly, Pataskala, O.....
<i>Four animals of either sex.</i>			
Jos. Defrees, Piqua, O.	First	30 00
Thomas F. Hunt, <i>Expert Judge.</i>			

AYRSHIRES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
J. P. Beatty, Pataskala, O.....	Tallahasse.....	First	\$20 00
R. J. & W. J. Munce, Clokey, Pa.....	Sir Lochenar.....	Second.....	10 00
<i>Bull 2 years old and under 3.</i>			
J. P. Beatty, Pataskala, O.....	Wapeta.....	Second.....	10 00
R. J. & W. J. Munce, Clokey, Pa.....	White Face Jack.....	First	20 00
Same.....	Red Riley.....	Third.....	.....
<i>Bull 1 year old and under 2.</i>			
J. P. Beatty, Pataskala, O.....	Tornado.....	First	10 00
R. J. & W. J. Munce, Clokey, Pa.....	Wheeler Boy.....	Second.....	5 00
Same.....	Clokeyville Lad.....	Third.....	.....
<i>Bull calf.</i>			
J. P. Beatty, Pataskala, O.....	Vixen.....	First	10 00
Same.....	Leroy.....	Third.....	.....
R. J. & W. J. Munce, Clokey, Pa.....	Bouncer.....	Second.....	5 00
Same.....	Red Roy.....	.....	.....
<i>Cow 3 years old and over.</i>			
J. P. Beatty, Pataskala, O.....	Hillside Maid.....	Third .....	.....
Same.....	Mazeppa.....	.....	.....
R. J. & W. J. Munce, Clokey, Pa.....	Dora Pender.....	First	15 00
Same.....	Cordelia Sly.....	Second.....	10 00
<i>Cow or heifer 2 years old and under 3.</i>			
J. P. Beatty, Pataskala, O.....	Hazel.....	Second.....	5 00
Same.....	Daisy.....	Third.....	.....
R. J. & W. J. Munce, Clokey, Pa.....	White Rie Pender.....	First	10 00
Same.....	Madonna White.....	.....	.....
<i>Heifer 1 year old and under 2.</i>			
J. P. Beatty, Pataskala, O.....	Nellie Bly.....	Second.....	5 00
Same.....	Alline's Pet.....	Third.....	.....
R. J. & W. J. Munce, Clokey, Pa.....	Florence Jenkins.....	First	10 00
Same.....	.....	.....	.....
<i>Heifer calf.</i>			
J. P. Beatty, Pataskala, O.....	Blanco.....	Second.....	5 00
Same.....	Jesse.....	Third.....	.....
R. J. & W. J. Munce, Clokey, Pa.....	Spotted Mollie.....	First	10 00
Same.....	Gretna Lass.....

ENTRIES AND AWARDS.

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SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERD.			
<i>Bull and graded herd.</i>			
J. P. Beatty, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....	First.....	\$40 00
BREEDERS' HERDS.			
<i>Young herd.</i>			
J. P. Beatty, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....	First.....	40 00
<i>Four animals of either sex.</i>			
J. P. Beatty, Pataskala, O.....	First.....	30 00
R. J. & W. J. Munce, Clokey, Pa.....

Thomas F. Hunt, *Expert Judge.*

HOLSTEINS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
John E. Goddard, East Liverpool, O	Gudula P. Wetherland.....	First.....	\$20 00
W. B. Smith & Son, Columbus, O.....	Aggie B's. 2d Statesman.....	Second.....	10 00
<i>Bull 2 years old and under 3.</i>			
John E. Goddard, East Liverpool, O.....	Highland Beauty's Prince...	Second.....	10 00
W. B. Smith & Son, Columbus, O.....	Vaseline's Statesman.....	First.....	20 00
<i>Bull 1 year old and under 2.</i>			
John E. Goddard, East Liverpool, O.....	Gudula P. Wetherland 2d...	Second.....	5 00
W. B. Smith & Son, Columbus, O.....	Limit.....	First.....	10 00
<i>Bull calf.</i>			
John E. Goddard, East Liverpool, O.....	.....	First.....	15 00
Same.....	.....	.....	.....
C. W. Horr, Mgr., Wellington, O.....	.....	Third.....	.....
W. B. Smith & Son, Columbus, O.....	Casparis.....	Second.....	5 00
<i>Cow 3 years old and over.</i>			
John E. Goddard, East Liverpool, O.....	Castine Jacobs Ianthe.....	.....	.....
Same.....	Weehanken Ray 2d.....	.....	.....
Same.....	Highland Cornelia.....	.....	.....
C. W. Horr, Mgr., Wellington, O.....	Lucy Nadine.....	.....	.....
W. B. Smith & Son, Columbus, O.....	Vaseline.....	Third.....	.....
Same.....	Iolena Fairmont.....	First.....	15 00
Same.....	Adventuress 3d.....	Second.....	10 00
<i>Cow or heifer 2 years old and under 3.</i>			
John E. Goddard, East Liverpool, O.....	Cordora Pearl.....	Second.....	5 00
W. B. Smith & Son, Columbus, O.....	Nancy Dewdrop Hollander..	First.....	10 00
Same.....	Special.....	Third.....	.....
<i>Heifer 1 year old and under 2.</i>			
John E. Goddard, East Liverpool, O.....	Highland P. Key.....	Third.....	.....
Same.....	.....	.....	.....
W. B. Smith & Son, Columbus, O.....	Mary Hilton.....	First.....	10 00
Same.....	Miss Sharp.....	Second.....	5 00

AGRICULTURAL REPORT.

HOLSTEINS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Heifer calf.</i>			
John E. Goddard, East Liverpool, O.....	.....	Second.....	\$5 00
Same.....	.....	.....	.....
W. B. Smith & Son, Columbus, O.....	Margalyn, 2d.....	First.....	10 00
Same.....	Ginger.....	Third.....	.....

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERD.			
<i>Bull and Graded Herd.</i>			
John E. Goddard, East Liverpool, O.....	First.....	\$40 00
W. B. Smith & Son, Columbus, O.....
BREEDERS' HERD.			
<i>Young herd.</i>			
W. B. Smith & Son, Columbus, O.....	First.....	40 00
<i>Four animals of either sex.</i>			
W. B. Smith & Son, Columbus, O.....	First.....	30 00

Thomas F. Hunt, *Expert Judge.*

BLACK POLLS.

Owner's Name and Post-office,	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
D. Bradfute & Son, Cedarville, O.....	Zaire, 5th.....	Second.....	\$10 00
Same.....	Quinto, of Meadow Brook.....	First.....	20 00
Goodwin & Judy, West Lebanon, Ind.....	Blackbird Jim.....	.....	.....
<i>Bull 2 years old and under 3.</i>			
D. Bradfute & Son, Cedarville O.....	Gay Erie.....	First.....	20 00
<i>Bull 1 year old and under 2.</i>			
D. Bradfute & Son, Cedarville, O.....	Quinby, of Meadow Brook.....	First.....	10 00
Goodwin & Judy, West Lebanon, Ind.	Blackcap King.....	.....	.....
<i>Bull calf.</i>			
D. Bradfute & Son, Cedarville, O.....	Fay, of Meadow Brook.....	First.....	10 00
Same.....	Fresno, of Meadow Brook..	Second.....	5 00
Goodwin & Judy, West Lebanon, Ind.....	Blackcap Monarch.....	.....	.....
<i>Cow 3 years old and over.</i>			
D. Bradfute & Son, Cedarville, O.....	Lavender, of Mead'w Brook	First.....	15 00
Same.....	Lillian, of Meadow Brook...	Second.....	10 00
Goodwin & Judy, West Lebanon, Ind.....	Zaire, 4th.....	.....	.....
Same.....	Rosebud Theta.....	.....	.....

BLACK POLLS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Cow or heifer 2 years old and under 3.</i>			
D. Bradfute & Son, Cedarville, O.....	Bernice of Meadow Brook....	Second.	\$5 00
Same	Bertha of Meadow Brook....	First.....	10 00
Goodwin & Judy, West Lebanon, Ind.....	Blackcap 8th.....		
Same	Zaire 6th.....		
<i>Heifer 1 year old and under 2.</i>			
D. Bradfute & Son, Cedarville, O	Bonita of Meadow Brook.....	Second.	5 00
Same	Lady of Meadow Brook.....	First.....	10 00
Goodwin & Judy, West Lebanon, Ind	Blackcap 10th.....		
Same	Rosebud Rho		
<i>Heifer calf.</i>			
D. Bradfute & Son, Cedarville, O.....	Linda of Meadow Brook....	First.....	10 00
Same	Altoona of Meadow Brook..	Second.	5 00

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITOR'S HERD.			
<i>Bull and graded herd.</i>			
D. Bradfute & Son, Cedarville, O.....		First.....	\$40 00
Goodwin & Judy, West Lebanon, Ind.....			
BREEDERS' HERDS.			
<i>Young herds.</i>			
D. Bradfute & Son, Cedarville, O.....		First.....	40 00
Goodwin & Judy, West Lebanon, Ind.....			
<i>Four animals of either sex.</i>			
D. Bradfute & Son, Cedarville, O.....		First.....	30 00
Goodwin & Judy, West Lebanon, Ind.....			

N. W. Baker, *Expert Judge.*

RED POLLS.

Owner's Name and Residence.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
Andrew & Bro., Cedarville, O.....	Vigorous.....	Third.....	
J. W. Vaughan & Son, Cardington, O.. ..	Lucie 2d.....	First.....	\$20 66
Frank Hartline, Strasburg, O.....	Cherokee	Second.	10 00
<i>Bull 1 year old and under 2.</i>			
Andrew & Bro., Cedarville, O.....	Bushnell.....	First.....	10 00
Same	Gov Bradley	Second.	5 00

RED POLLS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull calf.</i>			
Andrew & Bro., Cedarville, O.....	.....	First	\$10 00
Same .....	.....	Second.	5 00
J. W. Vaughan & Son, Cardington, O.....	Bounce .....	.....	.....
Frank Hartline, Strasburg, O.....	Climax.....	Third.....	.....
<i>Cow 3 years old and over.</i>			
Andrew & Bro., Cedarville, O.....	Nannette	Third.....	.....
Same	Vera	Second.	10 00
Same	Beauty of Cedarville.....	First	15 00
J. W. Vaughan & Son, Cardington, O.....	Jeanette.....	.....	.....
Same	Lady of the Park.....	.....	.....
Frank Hartline, Strasburg, O.....	Ruby Rose 7th.....	.....	.....
Same	Pretty Minnie .....	.....	.....
<i>Cow or heifer 2 years old and under 3.</i>			
Andrew & Bro., Cedarville, O.....	Mabel.....	Second.	5 00
J. W. Vaughan & Son, Cardington, O.....	Nantucket.....	First	10 00
Frank Hartline, Strasburg, O.....	Effie	Third.....	.....
<i>Heifer 1 year old and under 2.</i>			
Andrew & Bro., Cedarville, O.....	Vera 2d.....	First	10 00
J. W. Vaughan & Son, Cardington, O.....	Jose.....	Second.	5 00
Same	Lady Lou.....	Third.....	.....
Frank Hartline, Strasburg, O.....	Buleauh.....	.....	.....
<i>Heifer calf.</i>			
Anerew & Bro., Cedarville, O.....	.....	.....	.....
J. W. Vaughan & Son, Cardington, O.....	Peach Leaf 4th.....	First	10 00
Same	Joyce.....	Second.	5 00
Frank Hartline, Strasburg, O.....	Bonnie.....	Third.....	.....

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITOR'S HERD.			
<i>Bull and graded herd.</i>			
Andrew & Bro., Cedarville, O.....	First	\$40 00
J. W. Vaughan & Son, Cardington, O.....
Frank Hartline, Strasburg, O.....
BREEDERS' HERD.			
<i>Young herd.</i>			
J. W. Vaughan & Son, Cardington, O.....	First	40 00
<i>Four animals of either sex.</i>			
J. W. Vaughan & Son, Cardington, O.....	First	30 00
Andrew & Bro., Cedarville, O.....
Frank Hartline, Strasburg, O.....

POLLED DURHAMS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old and over.</i>			
J. H. Miller, Mexico, Ind.....	Young Hamilton.....	First	\$20 00
<i>Bull 2 years old and under 3.</i>			
J. H. Miller, Mexico, Ind.....	Gay Monarch, Jr.....	First	20 00
<i>Bull 1 year old and under 2.</i>			
J. H. Miller, Mexico, Ind.....	Young Athelstane.....	First	10 00
<i>Bull calf.</i>			
J. H. Miller, Mexico, Ind.....	Indian Chief.....	First	10 00
<i>Cow 3 years old and over.</i>			
J. H. Miller, Mexico, Ind.....	Lorena.....	First	15 00
Same	Red Rose 54th.....	Second.	10 00
<i>Cow or heifer 2 years old and under 3.</i>			
J. H. Miller, Mexico, Ind.....	Dora.....	First	10 00
Same	Ophelia Beauty.....	Second.	5 00
<i>Heifer 1 year old and under 2.</i>			
J. H. Miller, Mexico, Ind.....	Lilly Langtry.....	First	10 00
Same	Prime Rose 6th.....	Second.	5 00
<i>Heifer calf.</i>			
J. H. Miller, Mexico, Ind.....	Mary Hamilton.....	First	10 00
Same	Hoosier Maid.....	Second.	5 00

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
EXHIBITORS' HERD.			
<i>Bull and graded herd.</i>			
J. H. Miller, Mexico, Ind.....	First	\$40 00
BREEDERS' HERD			
<i>Young herd.</i>			
J. H. Miller, Mexico, Ind.....	First	40 00
<i>Four animals of either sex.</i>			
J. H. Miller, Mexico, Ind.....	First	30 00

GRAND SWEEPSTAKES—BEEF BREEDS

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Herd of 1 bull and 4 cows or heifers.</i>			
D. Bradfute & Son, Cedarville, O.	First	Sil. Cup
Same
J. H. Miller, Mexico, Ind.
J. A. Gerlaugh, Harshman, O.
Kellogg Stock Farm Co., Claridon, O.
W. I. Wood, Williamsport, O.
W. T. Miller & Son, Carlos, Ind.
D. W. Evans, Venedocia, O.
Clem Groves, Bunker Hill, Ind.
Thomas Clark, Beecher, Ill.
<i>Bull 2 years old and over.</i>			
D. Bradfute & Son, Cedarville, O.
Same
John Hooker, New London, O.
J. A. Gerlaugh, Harshman, O.
Kellogg Stock Farm Co., Claridon, O.
W. I. Wood, Williamsport, O.	Forest Chief, .....	.....	.....
W. T. Miller & Son, Carlos, Ind.
D. W. Evans, Venedocia, O.
Clem Groves, Bunker Hill, Ind.
J. H. Miller, Mexico, Ind.
Thos. Clark, Beecher, Ill.	First	Medal
<i>Bull under 2 years old.</i>			
D. Bradfute & Son, Cedarville, O.
Same
John Hooker, New London, O.
J. A. Gerlaugh, Harshman, O.
Kellogg Stock Farm Co., Claridon, O.
Goodwin and Judy, West Lebanon, O.
W. T. Miller & Son, Carlos, Ind.
Clem Groves, Bunker Hill, Ind.
J. H. Miller, Mexico, Ind.
Thos. Clark, Beecher, Ill.	First	Medal
<i>Cow 2 years old and over.</i>			
D. Bradfute & Son, Cedarville, O.
Same
Same
John Hooker, New London, O.
Kellogg Stock Farm Co., Claridon, O.
Goodwin and Judy, West Lebanon, Ind.
W. I. Wood, Williamsport, O.	Woodland Belle 9th .....	.....	.....
W. T. Miller & Son, Carlos, Ind.
D. W. Evans, Venedocia, O.
J. H. Miller, Mexico, Ind.
Clem Groves, Bunker Hill, Ind.
Thomas Clark, Beecher, Ill.	First	Medal
<i>Female under 2 years old.</i>			
D. Bradfute & Son, Cedarville, O.	First	Medal
Same
Same
John Hooker, New London, O.
Kellogg Stock Farm Co., Claridon, O.
Goodwin and Judy, West Lebanon, Ind.
W. I. Wood, Williamsport, O.
W. T. Miller & Son, Carlos, Ind.
D. W. Evans, Venedocia, O.
J. H. Miller, Mexico, Ind.
Thomas Clark, Beecher, Ill.

H. H. Clough, G. M. Roudebush and Benton Garinger, *Expert Judges.*

GRAND SWEEPSTAKES—DAIRY BREEDS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Herd of 1 bull and 4 cows or heifers.</i>			
James R. Orr, Cedarville, O.....	First	S. cup
Miller & Sibley, Franklin, Pa.....
A. S. Bell, London, O.....
W. B. Smith & Son, Columbus, O.....
J. P. Beatty, Pataskala, O.....
McCormick and Edgerly, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....
Mrs. A. M. Hallock, Columbus, O.....
<i>Bull 2 years old or over.</i>			
Miller & Sibley, Franklin, Pa.....	First	Medal
A. S. Bell, London, O.....
W. B. Smith & Son, Columbus, O.....
J. P. Beatty, Pataskala, O.....	Wapeta .....	.....	.....
McCormick and Edgerly, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....
Mrs. A. M. Hallock, Columbus, O.....
<i>Bull under 2 years old.</i>			
Miller & Sibley, Franklin, Pa.....	First	Medal
W. B. Smith & Son, Columbus, O.....
J. P. Beatty, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....
Mrs. A. M. Hallock, Columbus, O.....
<i>Cow 2 years old or over.</i>			
Miller & Sibley, Franklin, Pa.....
A. S. Bell, London, O.....
W. B. Smith & Son, Columbus, O.....	First	Medal
J. P. Beatty, Pataskala, O.....	Hillside Maid .....	.....	.....
McCormick & Edgerly, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....
Mrs. A. M. Hallock, Columbus, O.....
<i>Female under 2 years old.</i>			
Miller & Sibley, Franklin, Pa.....	First	Medal
J. P. Beatty, Pataskala, O.....	Hazel .....	.....	.....
McCormick & Edgerly, Pataskala, O.....
R. J. & W. J. Munce, Clokey, Pa.....
Mrs. A. M. Hallock, Columbus, O.....

Thomas F. Hunt, *Expert Judge.*

OHIO STATE DAIRY TEST.

BY STATE BOARD OF AGRICULTURE AND OHIO AGRICULTURAL EXPERIMENT STATION.

The usual state dairy test is more than ordinarily interesting this season for the reason that the several individual animals tested during the year have given results so nearly equal, especially in amount of butter fat produced within the prescribed twenty-four hours.

Another mark of interest is that two herds are represented this year that have not been entered in any previous test. As in previous years the several tests have been conducted at the home of the cow and at a time most suitable to the owner. Every precaution has been taken to see that the time was accurately given each cow.

The animals tested have in every instance been turned over to the tester, and they have been carefully milked clean before the test began under his immediate attention, the cow under test at no time being out of sight of the supervisor of this test, during the time of milking. The samples were taken as soon as each milking was completed, with a Sco-vill tester, and the sample at once cooled, then sealed and later tested at the Experiment Station laboratory.

This test concludes the eighth year that Ohio has had a state dairy test. A summary of these years shows that there has been thirty-one entries of Holstein, eleven Red Polled, five Jerseys and one Shorthorn.

The highest number of pounds of milk produced by one cow in twenty-four hours within these eight years was given by a cow owned by W. B. Smith & Son, of Columbus, Ohio; quantity 84.62 pounds.

The largest yield of butter fat, 2.44 pounds, was given by a cow from the same herd.

The following table gives the points of interest of this year's test, including name, breed of each cow, age, date of last calf, date of test, total weight of milk given in twenty-four hours, per cent. of butter fat, per cent. of solids not fat, total pounds of fat, total pounds of solids not fat and per cent. of total solids:

STATE DAIRY TEST BY STATE BOARD OF AGRICULTURE AND OHIO AGRICULTURAL EXPERIMENT STATION.

Name of cow.	Breed.	Age.	Last calf.	Date of test.	Total milk yield of	Per cent. fat.	Per cent. solids not fat.	Pounds total fat.	Pounds solids not fat.	Per cent. total solids.
Nieta	Holstein	7 years.....	May 7, 1896.....	May 19, 1896.....	60.00	3.4	8.20	2.04	4.92	11.60
Verbella May.....	Holstein	4 years.....	April 9, 1896.....	May 19 1896.....	70.07	2.8	9.10	1.97	6.40	11.90
Viola D.....	Holstein	8 years.....	January 4, 1896.....	March 7, 1896.....	70.00	3.0	9.24	2.10	6.468	12.24
Rowena of St. Lambert.....	Jersey	6 years.....	February 3, 1896	March 31, 1896.....	37.625	4.9	9.01	1.84	3.39	13.92
Lucy Nudine 2d.....	Holstein	5 years.....	March 3, 1896.....	May 12 1896.....	81.8125	2.8	8.10	2.29	6.62	10.90

The above table, as usual, shows a large preponderance of Holsteins. Two of these, by W. B. Smith & Son, of Columbus, Ohio, one by Mrs. C. W. Horr, of Wellington, Ohio, one by L. V. Axtell, of Perry, Lake county, Ohio, and one Jersey by Mrs. A. M. Hallock, of Columbus.

The first premium offered this year was a silver cup for the largest yield of butter fat in twenty-four hours. This was won by Lucy Nudine 2d, with a yield of 2.29 pounds, owned by Mrs. C. W. Horr.

Second premium of silver medal, for next largest yield of butter fat was won by Viola D, with a product of 2.10 pounds of butter fat, owned by L. V. Axtell. A silver cup was also offered for the cow producing in twenty-four hours the largest amount of solids, not including fat, and a second premium for the next largest quantity of solids not fat. The first of these was taken by Lucy Nudine 2d, with a yield of 6.62 pounds solids not fat. The second by Viola D., with a yield of 6.46 pounds. It may be noticed here that Verbella May gave 6.40 pounds, making very close competition for solids not fat. This year's test is certainly an improvement on any previous test. The six cows entered have averaged nearly two and one-sixth pounds of butter fat, while the average of any preceding test has not reached two pounds.

These tests go to show that cows producing three pounds of butter per day in Ohio are scarce, and further indicate that a cow producing two pounds per day is a very superior animal to that found in the average herd. The rules governing this test require all animals tested during the year to be exhibited on the State Fair grounds during the fair. This year two were tested that were not on the grounds. One was entered by Mrs. Horr, of Wellington, O., and made a good test, but for some reason was not exhibited, and therefore barred from competition. The other cow tested but not exhibited was owned by L. V. Axtell, of Perry, Ohio. She was admitted for the premiums on account of sickness, which is provided for under rule 4, as follows:

"No award will be made to any owner whose cow is not present during the fair. Unless, in the meantime, the cow has died or contracted some contagious disease."

Respectfully submitted,

J. FREMONT HICKMAN, *Tester.*

OHIO EXPERIMENT STATION, *Sept. 3, 1896.*

SPECIAL OFFERS

BY THE

AMERICAN HEREFORD CATTLE BREEDERS' ASSOCIATION.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Bull 3 years old or over.</i>			
Thomas Clark, Beecher, Ill	Lart	First	\$7 00
Clem Groves, Bunker Hill Ind. ....	.....	Second.	4 00
Thomas W. Herron, Freeland, O.	Actor	Third.....	2 00
<i>Bull 2 years old and under 3.</i>			
John Hooker, New London, O.	Java.....	First.....	\$7 00
G. W. Harness, Galveston, Ind.	Gay Lad.....	Third.....	2 00
Clem Groves, Bunker Hill, Ind. ....	.....	Second.	4 00
<i>Bull 1 year old and under 2.</i>			
Thomas Clark, Beecher, Ill	Littleton.....	First.....	\$6 00
G. W. Harness, Galveston, Ind.	Thanksgiving	Second.	4 00
W. H. Crawford & Son, Rix Mills, O.	McKinley.....	Third.....	2 00
<i>Bull under 1 year old.</i>			
John Hooker, New London, O. ....	.....	First.....	\$6 00
Clem Groves, Bunker Hill, Ind. ....	.....	Second.	4 00
Thomas Clark, Beecher, Ill	Peerless Weton 29th.....	Third.....	2 00
Thomas W. Herron, Freeland, O.	Hodax.....	.....	.....
<i>Cow 3 years old or over.</i>			
John Hooker, New London, O. ....	.....	First.....	\$7 00
Thomas Clark, Beecher, Ill	Juvenile.....	Second.	4 00
Thomas W. Herron, Freeland, O.	Millie of Rockland	Third.....	2 00
G. W. Harness, Galveston, Ind.	Pet.....	.....	.....
<i>Heifer 2 years old and under 3.</i>			
John Hooker, New London, O. ....	.....	First.....	\$7 00
Thomas Clark, Beecher, Ill	Jessamine.....	Third.....	2 00
G. W. Harness, Galveston, Ind.	Lady Fay.....	Second.	4 00
Thomas Clark, Beecher, Ill	Purity.....	.....	.....
<i>Heifer 1 year old and under 2.</i>			
John Hooker, New London, O. ....	.....	First.....	\$6 00
Thomas Clark, Beecher Ill.	Juno.....	Second.	4 00
Same	Adorable	Third.....	2 00
Thomas W. Herron, Freeland, O.	Duchess.....	.....	.....
<i>Heifer under 1 year old.</i>			
John Hooker, New London, O.	Dolly 5th.....	Third.....	\$2 00
Thomas Clark, Beecher, Ill	Perfect	First.....	6 00
Same	Elegant	Second.	4 00

Expert Judge—N. W. Baker,

SHEEP—G. LIGGETT, Member in charge.

MERINOS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
F. W. Perkins, West Mansfield O.....	Challenge.....	Second.	\$5 00
S. Blamer & Son, Johnstown, O.....			
Same.....			
J. Lovett & Son, Quincy, O.....	Protection.....	Third.....	
J. M. Flanagan, Niles, O.....	Ohio Boy.....		
R. L. Spencer, Salesville, O.....			
D. W. Evans, Venedocia, O.....			
O. Watkins, Maynard, O.....			
Same.....			
Wilson Bros., Fredericktown, O.....		First.....	10 00
<i>Ram 1 year old and under 2.</i>			
F. W. Perkins, West Mansfield O.....		Second.	5 00
J. A. Bell & Son, Ashley, O.....			
S. Blamer & Son, Johnstown, O.....		First.....	10 00
J. Lovett & Son, Quincy, O.....			
J. M. Flanagan, Niles, O.....		Third.....	
Same.....			
R. L. Spencer, Salesville, O.....			
O. Watkins, Maynard O.....			
<i>Ram lamb.</i>			
F. W. Perkins West Mansfield O.....		First.....	5 00
Same.....		Second.	3 00
J. A. Bell & Son, Ashley, O.....			
S. Blamer & Son, Johnstown, O.....		Third.....	
Same.....			
J. Lovett & Son Quincy, O.....			
J. M. Flanagan, Niles, O.....			
R. L. Spencer, Salesville, O.....			
O. Watkins, Maynard, O.....			
<i>Ewe 2 years old and over.</i>			
J. A. Bell & Son, Ashley O.....			
Same.....			
S. Blamer & Son, Johnstown, O.....		First.....	10 00
J. Lovett & Son, Quincy, O.....		Second.	5 00
J. M. Flanagan, Niles, O.....		Third.....	
Same.....			
R. L. Spencer, Salesville, O.....			
O. Watkins, Maynard, O.....			
Same.....			
<i>Ewe 1 year old and under 2.</i>			
F. W. Perkins, West Mansfield, O.....			
S. Blamer & Son, Johnstown, O.....			
J. Lovett & Son, Quincy, O.....		First.....	10 00
J. M. Flanagan, Niles, O.....		Second.	5 00
R. L. Spencer, Salesville, O.....			
O. Watkins, Maynard, O.....			
Same.....			
Wilson Bros., Fredericktown, O.....		Third.....	
<i>Ewe lamb.</i>			
F. W. Perkins, West Mansfield, O.....		First.....	5 00
J. A. Bell & son Ashley O.....			
S. Blamer & Son, Johnstown, O.....			
J. Lovett & Son, Quincy, O.....		Second.	3 00
J. M. Flanagan, Niles, O.....		Third.....	
R. L. Spencer, Salesville, O.....			
O. Watkins, Maynard, O.....			
Same.....			
F. W. Perkins, West Mansfield, O.....			

Uriah Cook, W. Mansfield, O, *Expert Judge.*

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DELAINE MERINOS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
R. L. Scott, South Burgettstown, Pa.....	Wonderful.....		
A. T. Gamber, Wakeman, O.....	American Standard..	Second.	\$5 00
Same.....	Keystone.....		
J. M. Flanagan, Niles, O.....	McKinley.....	Third.....	
O. Watkins, Maynard, O.....			
Same.....			
Wilson Bros., Fredericktown, O.....	Longfellow.....	First.....	10 00
D. W. Evans, Venedocia, O.....			
W. P. Penry & Bro., Radnor, O.....			
<i>Ram 1 year old and under 2.</i>			
L. R. Scott, South Burgettstown, Pa.....	Tom Reed.....		
A. T. Gamber, Wakeman, O.....		Third.....	
Same.....			
Same.....			
J. M. Flanagan, Niles, O.....		Second.....	5 00
O. Watkins, Maynard, O.....			
Wilson Bros., Fredericktown, O.....		First.....	10 00
D. W. Evans, Venedocia, O.....			
W. P. Penry & Bro., Radnor, O.....			
<i>Ram lamb.</i>			
L. R. Scott, South Burgettstown, Pa.....			
A. T. Gamber, Wakeman, O.....		First.....	5 00
Same.....		Second.....	3 00
J. M. Flanagan, Niles, O.....			
O. Watkins, Maynard, O.....			
W. P. Penry & Bro., Radnor, O.....		Third.....	
<i>Ewe 2 years old and over.</i>			
L. R. Scott, South Burgettstown, Pa.....			
Same.....			
A. T. Gamber, Wakeman, O.....		First.....	10 00
Same.....		Second.....	5 00
Same.....			
J. A. Bell & Son, Ashley, O.....			
J. M. Flanagan, Niles, O.....			
Same.....			
O. Watkins, Maynard, O.....			
Same.....			
Wilson Bros., Fredericktown, O.....		Third.....	
W. P. Penry & Bro., Radnor, O.....			
<i>Ewe 1 year old and under 2.</i>			
L. R. Scott, South Burgettstown, Pa.....			
A. T. Gamber, Wakeman, O.....		Third.....	
Same.....			
J. A. Bell & Son, Ashley, O.....			
J. M. Flanagan, Niles, O.....		Second.....	5 00
Same.....			
O. Watkins, Maynard, O.....			
Wilson Bros., Fredericktown, O.....		First.....	10 00
W. P. Penry & Bro., Radnor, O.....			
<i>Ewe lamb.</i>			
L. R. Scott, South Burgettstown, Pa.....			
A. T. Gamber, Wakeman, O.....		First.....	5 00
Same.....		Second.....	3 00
J. M. Flanagan, Niles, O.....			
O. Watkins, Maynard, O.....		Third.....	
W. P. Penry & Bro., Radnor, O.....			

Expert Judge—Uriah Cook, W. Mansfield, O.

FRENCH MERINOS.—RAMBOUILLETS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
A. A. Bates, Irwin, O.....	First.....	\$10 00
O. E. Lincoln & Son, Milford Center, O.....	Second.....	5 00
Same.....	Third.....	.....
<i>Ram 1 year old and under 2.</i>			
A. A. Bates, Irwin, O.....	First.....	10 00
O. E. Lincoln & Son, Milford Center, O.....	Second.....	5 00
Same.....	Third.....	.....
<i>Ram lamb.</i>			
A. A. Bates, Irwin, O.....	Second.....	3 00
Same.....
O. E. Lincoln & Son, Milford Center, O.....	First.....	5 00
Same.....	Third.....	.....
<i>Ewe 2 years old and over.</i>			
A. A. Bates, Irwin, O.....	Second.....	5 00
Same.....
O. E. Lincoln & Son, Milford Center, O.....	First.....	10 00
Same.....	Third.....	.....
<i>Ewe 1 year old and under 2.</i>			
A. A. Bates, Irwin, O.....	Second.....	5 00
O. E. Lincoln & Son, Milford Center, O.....	First.....	10 00
Same.....	Third.....	.....
<i>Ewe lamb.</i>			
A. A. Bates, Irwin, O.....	First.....	5 00
Same.....	Second.....	3 00
O. E. Lincoln & Son, Milford Center, O.....	Third.....	.....
Same.....

Uriah Cook, W. Mansfield, O.,—*Expert Judge.*

LONG WOOLS—LINCOLNS, COTSWOLDS, LEICESTERS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
D. B. & R. C. Watt, Xenia, O.....	Second.....	\$ 5 00
Wilson & Bro., Muncie, Ind.....	First.....	10 00
Artz Bros., New Carlisle, O.....	Third.....	.....
U. G. Shetler, Wilmot, O.....
<i>Ram 1 year old and under 2.</i>			
D. B. & R. C. Watt, Xenia, O.....	Second.....	5 00
Same.....	Third.....	.....
Wilson & Bro., Muncie, Ind.....	First.....	10 00
U. G. Shetler, Wilmot, O.....
<i>Ram lamb.</i>			
Wilson & Bro., Muncie, Ind.....	Third.....
Same.....
D. B. & R. C. Watt, Xenia, O.....	First.....	5 00
U. G. Shetler, Wilmot, O.....	Second.....	3 00

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LONG WOOL—Continued.

Owner's name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ewe 2 years old and over.</i>			
D. B. & R. C. Watt, Xenia, O.....		Third.....	
Wilson & Bro., Muncie, Ind.....		First.....	\$10 00
Same.....		Second.....	5 00
U. G. Shetler, Wilmot, O.....			
<i>Ewe 1 year old and under 2.</i>			
D. B. & R. C. Watt, Xenia, O.....		Third.....	
Same.....			
Wilson & Bro., Muncie, Ind.....		First.....	10 00
Same.....		Second.....	5 00
U. G. Shetler, Wilmot, O.....			
<i>Ewe lamb.</i>			
D. B. & R. C. Watt, Xenia, O.....		Second.....	3 00
Wilson & Bro., Muncie, Ind.....		First.....	5 00
Same.....		Third.....	
U. G. Shetler, Wilmot, O.....			

S. H. Todd, Wakeman, O., *Expert Judge.*

OXFORD DOWNS.

Owner's name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
J. C. Williamson, Xenia, O.....		Second.....	\$5 00
Duvall & Taylor, Alliance, O.....		First.....	10 00
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		Third.....	
<i>Ram 1 year old and under 2.</i>			
J. C. Williamson, Xenia, O.....		First.....	10 00
Duvall & Taylor, Alliance, O.....		Third.....	
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		Second.....	5 00
<i>Ram lamb.</i>			
J. C. Williamson, Xenia, O.....		Second.....	3 00
Duvall & Taylor, Alliance, O.....		Third.....	
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		First.....	5 00
<i>Ewe 2 years old and over.</i>			
J. C. Williamson, Xenia, O.....		Second.....	5 00
Duvall & Taylor, Alliance, O.....		Third.....	
Same.....			
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		First.....	10 00
<i>Ewe 1 year old and under 2.</i>			
J. C. Williamson, Xenia, O.....		First.....	10 00
Duvall & Taylor, Alliance, O.....		Second.....	5 00
Same.....			
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		Third.....	
<i>Ewe lamb.</i>			
Duvall & Taylor, Alliance, O.....		Second.....	3 00
Same.....			
J. C. Williamson, Xenia, O.....		First.....	5 00
W. A. Shafor, Middletown, O.....			
Rinear Bros., Brecksville, O.....		Third.....	

W. N. Cowden, Quaker City, O., *Expert Judge.*

SHROPSHIRE DOWNS.

Owner's Name and Post-office,	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
H. W. Chaffee, Brecksville, O.....	Meridith.....	First.....	\$10 00
I. J. Williams & Sons, Muncie, Ind.....		Second.....	5 00
Same.....		Third.....	
<i>Ram 1 year old and under 2.</i>			
H. W. Chaffee, Brecksville, O.....	McKinley.....	Second.....	5 00
I. J. Williams & Sons, Muncie, Ind.....		First.....	10 00
Same.....		Third.....	
<i>Ram lamb.</i>			
H. W. Chaffee, Brecksville, O.....		Second.....	3 00
Same.....			
I. J. Williams & Sons, Muncie, Ind.....		Third.....	
Same.....			
S. H. Todd & Son, Wakeman, O.....		First.....	5 00
Same.....			
A. A. Bates, Irwin, O.....			
C. W. O'Harra, Galloway, O.....			
<i>Ewe 2 years old and over.</i>			
C. W. O'Harra, Galloway, O.....			
H. W. Chaffee, Brecksville, O.....		Second.....	5 00
Same.....			
I. J. Williams & Sons, Muncie, Ind.....		First.....	10 00
Same.....		Third.....	
<i>Ewe 1 year old and under 2.</i>			
H. W. Chaffee, Brecksville, O.....		First.....	10 00
Same.....		Second.....	5 00
I. J. Williams & Sons, Muncie, Ind.....		Third.....	
Same.....			
<i>Ewe lamb.</i>			
H. W. Chaffee, Brecksville, O.....		Third.....	
Same.....			
I. J. Williams & Sons, Muncie, Ind.....		Second.....	3 00
Same.....			
S. H. Todd & Son, Wakeman, O.....		First.....	5 00
Same.....			
C. W. O'Harra, Galloway, O.....			

W, N. Cowden, Quaker City, O., *Expert Judge.*

HAMPSHIRE DOWNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
Artz Bros., New Carlisle, O.....		First.....	\$10 00
Same.....		Second.....	5 00
<i>Ram 1 year old and under 2.</i>			
Artz Bros., New Carlisle, O.....		First.....	10 00
Same.....		Second.....	5 00
<i>Ram lamb.</i>			
Artz Bros., New Carlisle, O.....		First.....	5 00
Same.....		Second.....	3 00

HAMPSHIRE DOWNS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ewe 2 years old and over.</i>			
Artz Bros., New Carlisle, O.....	First	\$10 00
Same	Second	5 00
<i>Ewe 1 year old and under 2.</i>			
Artz Bros., New Carlisle, O.....	First	10 00
Same	Second	5 00
<i>Ewe lamb.</i>			
Artz Bros., New Carlisle O.....	First	5 00
Same	Second	3 00

W. N. Cowden, *Expert Judge.*

SOUTHDOWNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram 2 years old and over.</i>			
W. U. Noble, Brecksville, O.....	.....	First	10 00
C. C. Shaw & Son, Newark, O.....	Windsor VII.....	.....	.....
Same	Shaw 75.....	.....	.....
D. B. & R. C. Watt, Xenia, O.....	.....	Second	5 00
D. W. Evans, Venedocia, O.....	.....	Third .....	.....
<i>Ram 1 year old and under 2.</i>			
W. U. Noble, Brecksville, O.....	.....	First	10 00
Same .....	.....	.....	.....
D. W. Evans, Venedocia O.....	.....	.....	.....
C. C. Shaw & Son, Newark, O.....	Shaw 100.....	Second	5 00
Same	Shaw 102.....	.....	.....
D. B. & R. C. Watt, Xenia, O.....	.....	Third .....	.....
<i>Ram lamb.</i>			
W. U. Noble, Brecksville, O.....	.....	First	5 00
Same .....	.....	Second	3 00
C. C. Shaw & Son, Newark, O.....	.....	Third .....	.....
D. B. & R. C. Watt, Xenia, O.....	.....	.....	.....
Same .....	.....	.....	.....
<i>Ewe 2 years old and over.</i>			
W. U. Noble, Brecksville O.....	.....	First	10 00
Same .....	.....	Second	5 00
C. C. Shaw & Son, Newark, O.....	G. & H. 413.....	Third .....	.....
Same	G. & H.....	.....	.....
D. B. & R. C. Watt, Xenia O.....	.....	.....	.....
D. W. Evans, Venedocia O.....	.....	.....	.....
<i>Ewe 1 year old and under 2.</i>			
W. U. Noble, Brecksville, O.....	.....	First	10 00
Same .....	.....	Second	5 00
C. C. Shaw & Son, Newark, O.....	Shaw 97.....	Third .....	.....
Same	Shaw 101.....	.....	.....
D. B. & R. C. Watt, Xenia, O.....	.....	.....	.....
D. W. Evans, Venedocia, O.....	.....	.....	.....
<i>Ewe lamb.</i>			
W. U. Noble Brecksville, O.....	.....	First	5 00
Same .....	.....	Second	3 00
C. C. Shaw & Son, Newark, O.....	.....	Third .....	.....
D. B. & R. C. Watt, Xenia, O.....	.....	.....	.....
Same .....	.....	.....	.....

W. N. Cowden, *Expert Judge.*

SWEEPSTAKES ON MERINOS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock, of one ram of any age, one ewe 2 years old or over, one ewe 1 year old and under 2, and one ewe under 1 year. Ram owned and ewes owned and bred by the exhibitor.</i>			
F. W. Perkins, West Mansfield, O.....
S. Blamer & Son, Johnstown, O.....
J. Lovett & Son, Quincy, O.....
J. M. Flanagan, Niles, O.....	First.....	\$15 00
R. L. Spencer, Salesville, O.....
O. Watkins, Maynard, O.....
<i>Pen of 4 lambs.</i>			
F. W. Perkins, West Mansfield, O.....	First.....	15 00
S. Blamer & Son, Johnstown, O.....
J. Lovett & Son, Quincy, O.....
J. M. Flanagan, Niles, O.....
R. L. Spencer, Salesville, O.....
<i>Ram of any age.</i>			
F. W. Perkins, West Mansfield, O.....
S. Blamer & Son, Johnstown, O.....
J. Lovett & Son, Quincy, O.....
J. M. Flanagan, Niles, O.....
R. L. Spencer, Salesville, O.....
O. Watkins, Maynard, O.....
Wilson Bros., Fredericktown, O.....	First.....	10 00
<i>Ewe of any age.</i>			
J. A. Bell & Son, Ashley, O.....
S. Blamer & Son, Johnstown, O.....	First.....	10 00
J. Lovett & Son, Quincy, O.....
J. M. Flanagan, Niles, O.....
R. L. Spencer, Salesville, O.....
O. Watkins, Maynard, O.....

Frank Moore Green Spring, O., *Expert Judge.*

SWEEPSTAKES ON DELAINE MERINOS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock, of one ram of any age, one ewe 2 years old or over, one ewe 1 year old and under 2, and one ewe under 1 year. Ram owned and ewes owned and bred by the exhibitor</i>			
L. R. Scott, South Burgettstown, Pa.....
A. T. Gamber, Wakeman, O.....	First.....	\$15 00
J. M. Flanagan, Niles, O.....
Wilson Bros., Fredericktown, O.....
<i>Pen of 4 lambs.</i>			
L. R. Scott, South Burgettstown, Pa.....
A. T. Gamber, Wakeman, O.....	First.....	15 00
<i>Ram of any age</i>			
L. R. Scott, South Burgettstown, Pa.....
A. T. Gamber, Wakeman, O.....
J. M. Flanagan, Niles, O.....	First.....	10 00
O. Watkins, Maynard, O.....
Wilson Bros., Fredericktown, O.....
<i>Ewe of any age.</i>			
L. R. Scott, South Burgettstown, Pa.....
A. T. Gamber, Wakeman, O.....
J. A. Bell & Son, Ashley, O.....
J. M. Flanagan, Niles, O.....
Wilson Bros., Fredericktown, O.....	First.....	10 00
W. P. Penry & Bro., Radnor, O.....

Frank Moore, Green Spring, O., *Expert Judge.*

SWEEPSTAKES ON RAMBOUILLETS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock.</i>			
A. A. Bates, Irwin, Ohio.....	First.....	\$15 00
O. E. Lincoln & Son, Milford Center, O.....
<i>Pen of 4 lambs.</i>			
A. A. Bates, Irwin, O.....	First.....	\$15 00
O. E. Lincoln & Son, Milford Center, O.....
<i>Ram of any age.</i>			
A. A. Bates, Irwin, O.....	First.....	\$10 00
O. E. Lincoln & Son, Milford Center, O.....
<i>Ewe of any age.</i>			
A. A. Bates, Irwin, O.....	First.....	\$10 00
O. E. Lincoln & Son, Milford Center, O.....

Frank Moore, Green Springs, O., *Expert Judge.*

SWEEPSTAKES ON LONG WOOLS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock.</i>			
D. B. & R. C. Watt, Xenia, O.....	First.....	\$15 00
Wilson & Bro., Muncie, Ind.....
<i>Pen of 4 lambs.</i>			
Wilson & Bro., Muncie, Ind.....	First.....	\$15 00
D. B. & R. C. Watt, Xenia, O.....
<i>Ram of any age.</i>			
D. B. & R. C. Watt, Xenia, O.....	First.....	\$10 00
Wilson & Bro., Muncie, Ind.....
Artz Bros., New Carlisle, O.....
<i>Ewe of any age.</i>			
D. B. & R. C. Watt, Xenia, O.....	First.....	\$10 00
Wilson & Bro., Muncie, Ind.....
Same.....
U. G. Shetler, Wilmot, O.....

James P. Carter, Marysville, O., *Expert Judge.*

SWEEPSTAKES ON SOUTH DOWNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock.</i>			
W. U. Noble, Brecksville, O.....	First.....	\$15 00
C. C. Shaw & Son, Newark, O.....
<i>Pen of 4 lambs.</i>			
W. U. Noble, Brecksville, O.....	First.....	\$15 00
C. C. Shaw & Son, Newark, O.....

SWEEPSTAKES ON SOUTH DOWNS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram of any age.</i>			
W. U. Noble, Brecksville, O.....
C. C. Shaw & Son, Newark, O.....
D. B. & R. C. Watt, Xenia, O.....	First.....	\$10 00
D. W. Evans, Venedocia, O.....
<i>Ewe of any age.</i>			
W. U. Noble, Brecksville, O.....	First.....	\$10 00
Same.....
C. C. Shaw & Son, Newark, O.....
D. B. & R. C. Watt, Xenia, O.....

James P. Carter, Marysville, O., *Expert Judge.*

SWEEPSTAKES ON OXFORD DOWNS AND HAMPSHIRE DOWNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock.</i>			
J. C. Williamson, Xenia, O.....
W. A. Shafor, Middletown, O.....
Duvall & Taylor, Alliance, O.....
Rinear Bros., Brecksville, O.....	First.....	\$15 00
<i>Pen of 4 lambs.</i>			
W. A. Shafor, Middletown, O.....
Duvall & Taylor, Alliance, O.....
Rinear Bros., Brecksville, O.....	First.....	15 00
Artz Bros., New Carlisle, O.....
<i>Ram of any age.</i>			
J. C. Williamson, Xenia, O.....	First.....	10 00
Duvall & Taylor, Alliance, O.....
Rinear Bros., Brecksville, O.....
Artz Bros., New Carlisle, O.....
<i>Ewe of any age.</i>			
J. C. Williamson, Xenia, O.....	First.....	10 00
Duvall & Taylor, Alliance, O.....
Rinear Bros., Brecksville, O.....
Artz Bros., New Carlisle, O.....

James P. Carter, Marysville, O., *Expert Judge.*

SWEEPSTAKES ON SHROPSHIRE DOWNS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock.</i>			
H. W. Chaffee, Brecksville, O.....
I. J. Williams & Sons, Muncie, Ind.....	First.....	\$15 00
<i>Pen of 4 lambs.</i>			
H. W. Chaffee, Brecksville, O.....
I. J. Williams & Sons, Muncie, Ind.....
S. H. Todd & Son, Wakeman, O.....	First.....	15 00

SWEEPSTAKES ON SHROPSHIRE DOWNS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Ram of any age.</i>			
H. W. Chaffee, Brecksville, O.....	Meredith	First.....	\$10 00
I. J. Williams & Sons, Muncie, Ind.....
S. H. Todd & Son, Wakeman, O.....
<i>Ewe of any age.</i>			
H. W. Chaffee, Brecksville, O.....
Same
I. J. Williams & Sons, Muncie, Ind.....
S. H. Todd & Son, Wakeman, O.....	First.....	10 00

James P. Carter, Marysville, O., *Expert Judge.*

FAT SHEEP.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Pen of 2 wethers 2 years old.</i>			
C. C. Shaw & Son, Newark, O.....	First.....	8 00
<i>Pen of 2 wethers 1 year old and under 2.</i>			
S. H. Todd & Son, Wakeman, O.....	First.....	8 00
<i>Pen of 2 wether lambs.</i>			
C. C. Shaw & Son, Newark, O.....	Second.....	3 00
S. H. Todd & Son, Wakeman, O.....	First.....	5 00

Uriah Cook, W. Mansfield, O., *Expert Judge.*

WOOLS.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Fleece of fine wool.</i>			
John W. Carpenter, Batesville, O.....	First.....	5 00
Same
Same
Same
<i>Display of wools.</i>			
John W. Carpenter, Batesville, O.....	First.....	10 00

Uriah Cook, W. Mansfield, O., *Expert Judge.*

**SPECIAL PREMIUMS OFFERED BY THE AMERICAN OXFORD DOWN SHEEP RECORD
ASSOCIATION.**

Sheep to be bred and owned by the exhibitor in Ohio, and registered in the American Oxford Down Record, with A. O. D. R. A. ear tags inserted in the ears. Certificates of registry, under seal of the Association, must be presented at time of exhibition.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Pen of 4 lambs.</i>			
J. C. Williamson, Xenia, O.....			
W. A. Shafor, Middletown, O.....		Second.....	\$10 00
Same.....			
Rinear Bros., Brecksville, O.....		First.....	15 00
Duvall & Taylor, Alliance, O.....			
<i>Yearling ram.</i>			
J. C. Williamson, Xenia, O.....		Second.....	10 00
W. A. Shafor, Middletown, O.....			
Same.....			
Duvall & Taylor, Alliance, O.....		First.....	15 00
<i>Yearling ewe.</i>			
J. C. Williamson, Xenia, O.....			
Same.....			
W. A. Shafor, Middletown, O.....		Second.....	10 00
Same.....			
Duvall & Taylor, Alliance, O.....		First.....	15 00
Rinear Bros., Brecksville, O.....			
Duvall & Taylor, Alliance, O.....			

W. N. Cowden, *Expert Judge.*

**SPECIAL PREMIUMS OFFERED BY THE AMERICAN SHROPSHIRE REGISTRY ASSO-
CIATION.**

The above named Association offered the following special prizes:

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Flock of registered Shropshires consisting of 1 ram, 1 year old or over, and 3 ewes of any age; all to be owned by exhibitor at least ten days before showing.</i>			
H. W. Chaffee, Brecksville, O.....		First.....	\$15 00
I J. Williams & Sons, Muncie, Ind.....		Second.....	10 00
<i>Flock of 4 lambs (1 ram lamb and 3 ewe lambs); all to be owned by exhibitor at least ten days before showing.</i>			
H. W. Chaffee, Brecksville, O.....			
A. A. Bates, Irwin, O.....			
I J. Williams & Sons, Muncie, Ind.....		Second.....	10 00
S. H. Todd & Son, Wakeman, O.....		First.....	15 00

SPECIAL PREMIUMS, ETC.—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium	Amount.
<i>Flock of 4 lambs, 1 ram lamb and 3 ewe lambs, all to be bred and owned by exhibitor, who must be a resident of the state where prize is competed for.</i>			
H. M. Chaffee, Brecksville, Ohio	Second	\$10 00
A. A. Bates, Irwin, O.....	First	15 00
S. H. Todd & Son, Wakeman, O.....		

James P. Carter, *Expert Judge*.

SPECIAL PREMIUMS OFFERED BY THE AMERICAN SOUTHDOWN BREEDERS' ASSOCIATION.

The American Southdown Breeders' Association offers a special premium of the first five volumes of the American Southdown Record for pen of "four lambs"—*two rams and two ewes, the get of one ram*—bred and owned by exhibitor.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
C. C. Shaw & Son, Newark, O		
W. U. Noble, Brecksville, O.....	First.	.....

W. N. Cowden, *Expert Judge*.

SWINE—E. C. ELLIS, Member in Charge.

BERKSHIRES.

Owner's Name and Post-office.	Name of Animal,	Premium.	Amount.
<i>Boar 2 years old and over.</i>			
L. C. Peterson, Spring Valley, O.....	Bud.....		
O. P. Wolcott & Son, Conover, O.....	Columbus II.....	Third.....	
L. S. Ream, Oakwood, O.....			
R. Gentry, Danville, Ky.....	Elmwood Chief.....	Second.....	\$5 00
Connell & Son, Fayette O.....	Broad Gauge.....	First.....	10 00
<i>Boar 1 year old and under 2.</i>			
L. C. Peterson, Spring Valley, O.....	Little Jim.....		
Same.....	King Comett.....		
O. P. Wolcott & Son, Conover, O.....	Nick in Time.....	First.....	10 00
R. Gentry, Danville, Ky.....	Royal Metcalf.....		
J. D. Simms, Groveport, O.....	Quality.....	Second.....	5 00
Connell & Son, Fayette, O.....	Prince Broad Top.....		
James Riley, Thorntown, Ind.....		Third.....	
<i>Boar 6 months old and under 1 year.</i>			
L. C. Peterson, Spring Valley, O.....	Little Duke.....		
O. P. Wolcott & Son, Conover O.....	Lee's Model.....	Third.....	
Kellogg Stock Farm Co., Claridon, O.....	Lord Penneck.....	Second.....	5 00
Geo. B. Ashbaugh, Lancaster, O.....	Brave 2d.....		
R. Gentry, Danville, Ky.....	Fashion Duke II.....		
Connell & Son, Fayette O.....			
Same.....			
James Riley, Thorntown, Ind.....		First.....	8 00
<i>Boar under 6 months old.</i>			
L. C. Peterson, Spring Valley, O.....			
O. P. Wolcott & Son, Conover, O.....		First.....	5 00
Same.....		Second.....	3 00
Geo. B. Ashbaugh, Lancaster, O.....			
Same.....			
J. D. Simms, Groveport, O.....			
James Riley, Thorntown, Ind.....		Third.....	
Same.....			
<i>Boar and 3 sows over 1 year old.</i>			
L. C. Peterson, Spring Valley, O.....		Third.....	
O. P. Wolcott & Son, Conover, O.....		Second.....	10 00
Kellogg Stock Farm Co., Claridon, O.....			
R. Gentry, Danville, Ky.....			
Connell & Son, Fayette, O.....		First.....	20 00
James Riley, Thorntown, Ind.....			
<i>Boar and 3 sows under 1 year old.</i>			
L. C. Peterson, Spring Valley, O.....			
O. P. Wolcott & Son, Conover, O.....		Second.....	10 00
R. Gentry, Danville, Ky.....			
James Riley, Thorntown, Ind.....		First.....	20 00
Same.....		Third.....	
<i>Sow 2 years old or over</i>			
L. C. Peterson, Spring Valley O.....	Hopeful.....	First.....	10 00
Same.....	Fancy.....		
O. P. Wolcott & Son, Conover, O.....	Fancy Rose.....		
Kellogg Stock Farm Co., Claridon, O.....	Handsome Lady III.....		
R. Gentry, Danville, Ky.....	Lucile.....	Third.....	
Same.....	Handsome Lee II.....		
Connell & Son, Fayette, O.....	Nellie C.....	Second.....	5 00
James Riley, Thorntown, Ind.....			
D. E. Woodling, Beach City, O.....	Better Lee II.....		

ENTRIES AND AWARDS.

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BERKSHIRES—Continued.

Owner's name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Sow 1 year old and under 2.</i>			
L. C. Peterson, Spring Valley, O.....	.....	Third.....	.....
Same.....	.....	.....	.....
O. P. Wolcott & Son, Conover, O.....	Rose.....	First.....	\$10 00
Same.....	Rose May.....	.....	.....
R. Gentry, Danville, Ky.....	Kentucky Belle.....	.....	.....
Connell & Son, Fayette, O.....	Daisy.....	Second.....	5 00
Same.....	Cherry Blossom.....	.....	.....
James Riley Thorntown, Ind.....	.....	.....	.....
D. E. Woodling, Beach City, O.....	Miss Baker.....	.....	.....
<i>Sow 6 months old and under 1 year.</i>			
L. C. Peterson, Spring Valley, O.....	.....	Third.....	.....
Same.....	.....	.....	.....
O. P. Wolcott & Son, Conover, O.....	.....	Second.....	5 00
Same.....	.....	.....	.....
Kellogg Stock Farm Co., Claridon, O.....	Lady May.....	.....	.....
R. Gentry, Danville, Ky.....	Lady Fashion II.....	.....	.....
J. D. Simms, Groveport, O.....	Betsy.....	.....	.....
Connell & Son, Fayette, O.....	.....	First.....	8 00
Same.....	.....	.....	.....
James Riley Thorntown, Ind.....	.....	.....	.....
Same.....	.....	.....	.....
<i>Sow under 6 months old.</i>			
L. C. Peterson Spring Valley, O.....	.....	.....	.....
Same.....	.....	.....	.....
O. P. Wolcott & Son, Conover, O.....	.....	Third.....	.....
Same.....	.....	.....	.....
R. Gentry, Danville, Ky.....	Virginia Watkins.....	.....	.....
Same.....	Sister.....	.....	.....
James Riley Thorntown, Ind.....	.....	First.....	5 00
Same.....	.....	Second.....	3 00
<i>Four pigs under 6 months old.</i>			
L. C. Peterson, Spring Valley, O.....	.....	Third.....	.....
O. P. Wolcott & Son, Conover, O.....	.....	Second.....	5 00
Geo. B. Ashbaugh, Lancaster, O.....	.....	.....	.....
James Riley, Thorntown, Ind.....	.....	First.....	10 00
D. E. Woodling, Beach City, O.....	.....	.....	.....

John M. Jamison, Roxabell, O., *Expert Judge.*

POLAND CHINAS.

Owner's name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Boar 2 years old or over.</i>			
Bounds Bros., Atherton, O.....	Atherton Chief.....	.....	.....
M. McConnell Wakatomaka, O.....	Corbett.....	Second.....	\$5 00
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	First.....	10 00
Pyers Bros. & Co., Nashville, O.....	Major Wilks.....	.....	.....
B. F. Dorsey & Sons Perry, Ill.....	.....	Third.....	.....
J. M. Linson, South Solon, O.....	Germine Corwin.....	.....	.....
<i>Boar 1 year old and under 2.</i>			
Bounds Bros. Atherton, O.....	Atherton Corwin.....	.....	.....
Hiram Ingalls, Alton, O.....	Wilks Trade.....	.....	.....
R. A. Keer, South Warsaw, O.....	Treasurer U. S.....	Third.....	.....
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	First.....	10 00
Robinson & Lovett, Piqua, O.....	King Business.....	.....	.....
A. N. Wiseley, Oakwood, O.....	Chief Cook.....	.....	.....
W. L. West, Marengo, O.....	King Wilks.....	.....	.....

POLAND CHINAS—Continued.

Owner's Name and Postoffice.	Name of Animal	Premium.	Amount
<i>Boar 1 year old and under 2—Continued.</i>			
F. C. Lampe, Jeffersonville, O.....	.....	Second	\$5 00
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	
E. W. Morthland, Mansfield, O.....	Big Tom		
C. W. O'Harra, Galloway, O.....	Gay Wilks.		
Same	Black Tom		
B. F. Dorsey & Sons, Perry, Ill.....	.....	
<i>Boar 6 months old and under 1 year.</i>			
Bounds Bros., Atherton, O.....	Atherton Prince.		
M. McConnell, Wakatomaka, O.....	.....	
J. T. Hempstead, Lumberton, O.....	.....	
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	
Same	.....	First	5 00
W. L. West, Marengo, O.....	Ideal Chief		
Bruce Bros., Chesterville, O.....	The Corker.	Second	5 00
Same	.....	
John Salmon, Madison Mills, O.....	.....	Third	
E. W. Morthland, Mansfield, O.....	Clark		
Pyers Bros. & Co., Nashville, O.....	Tecumseh.		
B. F. Dorsey & Sons, Perry, Ill.....	.....	
Same	.....	
<i>Boar under 6 months old.</i>			
H. Bradford & Son, Rochester, O.....	.....	Third	
Same	.....	First	5 00
Hiram Ingalls, Alton, O.....	.....	
J. T. Hempstead, Lumberton, O.....	.....	
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	
Same	.....	
Robinson & Lovett, Piqua, O.....	.....	
Kolb & Starner, Ontario, O.....	.....	
Same	.....	
A. N. Wiseley, Oakwood, O.....	.....	
W. L. West, Marengo, O.....	.....	
Bruce Bros., Chesterville, O.....	.....	
E. W. Morthland, Mansfield, O.....	.....	
C. W. O'Harra, Galloway, O.....	.....	
B. F. Dorsey & Son, Perry, Ill.....	.....	Second	10 00
J. M. Linson, South Solon, O.....	.....	
<i>Boar and 3 sows over 1 year old.</i>			
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	First	20 00
A. N. Wiseley, Oakwood, O.....	.....	
E. W. Morthland, Mansfield, O.....	.....	Second	10 00
B. F. Dorsey & Son, Perry, Ill.....	.....	Third	
Same	.....	
<i>Boar and 3 sows under 1 year old.</i>			
H. Bradford & Son, Rochester, O.....	.....	Third	
Bounds Bros., Atherton, O.....	.....	
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	
A. N. Wiseley, Oakwood, O.....	.....	
W. L. West, Marengo, O.....	.....	
Bruce Bros., Chesterville, O.....	.....	First	20 00
John Salmon, Madison Mills, O.....	.....	
E. W. Morthland, Mansfield, O.....	.....	
B. F. Dorsey & Sons, Perry, Ill.....	.....	Second	10 00
<i>Sow 2 years old or over.</i>			
Bounds Bros., Atherton, O.....	Sanders' Choice.		
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	.....	Third	
Robinson & Lovett, Piqua, O.....	Graceful Mine.		
A. N. Wiseley, Oakwood, O.....	Queen Lil.		
W. L. West, Marengo, O.....	Graceful Girl 2d.	First	10 00
Same	Queen of Bennington		
E. W. Morthland, Mansfield, O.....	.....	
B. F. Dorsey & Sons, Perry, Ill.....	.....	Second	5 00
Same	.....	

POLAND CHINAS—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Sow 1 year old and under 2.</i>			
Ed. Klever, Hadley & Hendrick, Wilmington, O.....	Third.....	.....
Same.....
Robinson & Lovett, Piqua, O.....	Lady Burton.....	.....	.....
A. N. Wiseley, Oakwood, O.....	Queen Lil 2d.....	First.....	\$10 00
E. W. Morthland, Mansfield, O.....
Same.....	Daisy Jane.....	.....	.....
Pyers Bros. & Co., Nashville, O.....	Tecumseh Girl.....	.....	.....
B. F. Dorsey & Sons, Perry, Ill.....	Second.....	5 00
Same.....
Frank Wagner, Mansfield, O.....
<i>Sow 6 months old and under 1 year.</i>			
Bounds Bros., Atherton, O.....	Atherton Gladola.....	.....	.....
Hiram Ingalls, Alton, O.....
R. A. Kerr, South Warsaw, O.....	Lady Blain.....	.....	.....
Frank Wagner, Mansfield, O.....
Ed. Klever, Hadley & Hendrick, Wilmington, O.....
Same.....
A. N. Wiseley, Oakwood, O.....	Queen Avaline.....	.....	.....
W. L. West, Marengo, O.....
Bruce Bros., Chesterville, O.....	U. S. Belle A.....	First.....	8 00
Same.....	U. S. Belle B.....	.....	.....
John Salmon, Madison Mills, O.....	Second.....	5 00
Same.....	Third.....	.....
E. W. Morthland, Mansfield, O.....
Pyers Bros. & Co., Nashville, O.....
B. F. Dorsey & Sons, Perry, Ill.....
Same.....
J. M. Linson, South Solon, O.....
<i>Sow under 6 months old.</i>			
H. Bradford & Son, Rochester, O.....
Same.....
Bounds Bros., Atherton, O.....	Atherton Corwin Gem.....	First.....	5 00
Same.....	Atherton Corwin Gem 2d.....	.....	.....
Hiram Ingalls, Alton, O.....
Ed. Klever, Hadley & Hendrick, Wilmington, O.....
Same.....
Robinson & Lovett, Piqua, O.....
J. M. Linson, South Solon, O.....
Kolb & Starner, Ontario, O.....	Third.....	.....
Same.....
A. N. Wiseley, Oakwood, O.....
Same.....
W. L. West, Marengo, O.....
B. F. Dorsey & Sons, Perry, Ill.....
Bruce Bros., Chesterville, O.....	Second.....	3 00
J. M. Linson, South Solon, O.....
E. W. Morthland, Mansfield, O.....
C. W. O'Harra, Galloway, O.....
<i>4 pigs under 6 months old.</i>			
H. Bradford & Son, Rochester, O.....	First.....	10 00
Same.....
Bounds Bros., Atherton, O.....
R. A. Kerr, South Warsaw, O.....
M. McConnell, Wakatomaka, O.....
Ed. Klever, Hadley & Hendrick, Wilmington, O.....
Robinson & Lovett, Piqua, O.....
Kolb & Starner, Ontario, O.....	Second.....	5 00
W. L. West, Marengo, O.....	Third.....	.....
Bruce Bros., Chesterville, O.....
E. W. Morthland, Mansfield, O.....
C. W. O'Harra, Galloway, O.....
J. M. Linson, South Solon, O.....
B. F. Dorsey & Sons, Perry, Ill.....

CHESTER WHITES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Boar 2 years old or over.</i>			
P. T. Courter, Delaware, O.....	Hero	First	\$10 00
F. A. Branch, Medina, O.....	Bud.....	Third.....	
U. G. Shetler, Wilmot, O.....	Newark.....	Second.	5 09
E. S. Fawcett & Son, Chester Hill, O.....	Champion.....		
Pyers Bros. & Co., Nashville, O.....	Columbus.....		
Wm. T. Dever, Lucasville, O.....			
<i>Boar 1 year old and under 2.</i>			
J. L. Beringer, Marion, O.....	Tiptoe.....	Third.....	
B. P. Taylor, Marengo, O.....	Dandy.....	Second.	5 00
U. G. Shetler, Wilmot, O.....		First.....	10 00
E. S. Fawcett & Son, Chester Hill, O.....			
Wm. T. Dever, Lucasville, O.....	Columbia		
<i>Boar 6 months old and under 1 year.</i>			
P. T. Courter, Delaware, O.....	Chip.....		
D. A. Lane, Commercial Point, O.....			
J. L. Beringer, Marion, O.....	Charmer.....	Third.....	
L. H. Martin, Alexandria, O.....	Lew	First.....	8 00
Same		Second.	5 00
U. G. Shetler, Wilmot, O.....			
E. S. Fawcett & Son, Chester Hill, O.....	Billy		
C. W. Baker, Delaware, O.....	Richard		
Wm. T. Dever, Lucasville, O.....			
<i>Boar under 6 months old.</i>			
P. T. Courter, Delaware, O.....			
D. A. Lane, Commercial Point, O.....			
B. P. Taylor, Marengo, O.....			
L. H. Martin, Alexandria, O.....		Second.	3 00
Same			
S. H. Todd & Son, Wakeman, O.....	Briscoe.....		
F. A. Branch, Medina, O.....			
E. S. Fawcett & Son, Chester Hill, O.....	Tommy	Third.....	
C. W. Baker, Delaware, O.....	Ranger.....	First.....	5 00
Same			
Pyers Bros. & Co., Nashville, O.....	Thomas.....		
Wm. T. Dever, Lucasville, O.....			
<i>Boar and three sows over 1 year old.</i>			
P. T. Courter, Delaware, O.....		Third.....	
F. A. Branch, Medina, O.....		First.....	20 00
U. G. Shetler, Wilmot, O.....		Second.	10 00
<i>Boar and three sows under 1 year old.</i>			
P. T. Courter, Delaware, O.....			
D. A. Lane, Commercial Point, O.....			
B. P. Taylor, Marengo, O.....			
L. H. Martin, Alexandria, O.....		Second.	10 00
F. A. Branch, Medina, O.....		Third.....	
U. G. Shetler, Wilmot, O.....			
C. W. Baker, Delaware, O.....		First.....	20 00
<i>Sow 2 years old or over.</i>			
P. T. Courter, Delaware, O.....	Lady B.....	Third.....	
J. L. Beringer, Marion, O.....	Maud 2d.....	Second.	5 00
L. H. Martin, Alexandria, O.....	Lady Pedro.....		
F. A. Branch, Medina, O.....	Jewell.....	First.....	10 00
U. G. Shetler, Wilmot, O.....			
Wm. T. Dever, Lucasville, O.....	Waterloo.....		
<i>Sow 1 year old and under 2.</i>			
P. T. Courter, Delaware, O.....	Maud.....		
J. L. Beringer, Marion, O.....	White Lily.....		
B. P. Taylor, Marengo, O.....	Silver.....		
F. A. Branch, Medina, O.....	Bell B. 8th	Second.	5 00
U. G. Shetler, Wilmot, O.....		First.....	10 00
Same		Third.....	
Wm. T. Dever, Lucasville, O.....	Claude		

ENTRIES AND AWARDS

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CHESTER WHITES—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Sow 6 months old and under 1 year.</i>			
P. T. Courter, Delaware, O.....	P. of D. 7th		
D. A. Lane, Commercial Point, O.....			
J. L. Beringer, Mariou, O.....			
L. H. Martin, Alexandria, O.....	Ollie.....		
Same.....	Allie.....	Third.....	
F. A. Branch, Medina, O.....	Silver Girl.....	First.....	\$8 00
U. G. Shetler, Wilmot, O.....			
C. W. Baker, Delaware, O.....	Nellie.....	Second.....	5 00
Same.....	Dora.....		
Wm. T. Dever, Lucasville, O.....	Fanny.....		
<i>Sow under 6 months old.</i>			
P. T. Courter, Delaware, O.....			
David Mahan, Lookout, O.....			
Same.....			
D. A. Lane, Commercial Point, O.....			
B. P. Taylor, Marengo, O.....			
L. H. Martin, Alexandria, O.....		First.....	5 00
Same.....			
S. H. Todd & Son, Wakeman, O.....			
F. A. Branch, Medina, O.....	Dot B.....	Third.....	
Same.....	Dot B. 2d.....		
U. G. Shetler, Wilmot, O.....			
E. S. Fawcett & Son, Chester Hill, O.....			
C. W. Baker, Delaware, O.....	Dollie.....	Second.....	3 00
Same.....	Queen.....		
Pyers Bros. & Co., Nashville, O.....			
Wm. T. Dever, Lucasville, O.....			
<i>Four pigs under 6 months old.</i>			
P. T. Courter, Delaware, O.....			
David Mahan, Lookout, O.....			
B. P. Taylor, Marengo, O.....			
L. H. Martin, Alexandria, O.....		Second.....	5 00
Same.....		Third.....	
F. A. Branch, Medina, O.....			
C. W. Baker, Delaware, O.....		First.....	10 00
Wm. T. Dever, Lucasville, O.....			
S. H. Todd, Wakeman, O., <i>Expert Judge.</i>			

SUFFOLK, YORKSHIRE, CHESHIRE AND VICTORIA.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Boar 1 year old or over.</i>			
Joseph A. Ineichen, Celina, O.....		First.....	\$10 00
David Mahan, Lookout, O.....			
Chas. McClave, New London, O.....		Third.....	
Geo. Ineichen, Celina, O.....		Second.....	5 00
Same.....			
Jos. A. Ineichen, Celina, O.....			
<i>Boar under 1 year old.</i>			
Jos. A. Ineichen, Celina, O.....		Second.....	5 00
David Mahan, Lookout, O.....			
U. G. Shetler, Wilmot, O.....		Third.....	
Geo. Ineichen, Celina, O.....		First.....	10 00
Same.....			

SUFFOLK, YORKSHIRE, CHESHIRE AND VICTORIA.—Continued.

Owner's Name and Postoffice.	Name of Animal.	Premium.	Amount.
<i>Sow 1 year old or over.</i>			
Jos. A. Ineichen, Celina, O.....	Second.	\$5 00
David Mahan, Lookout, O.....	Third.....	.....
Chas. McClave, New London, O.....	First.....	10 00
Geo. Ineichen, Celina, O.....
Same
<i>Sow under 1 year old.</i>			
Jos. A. Ineichen, Celina, O.....	First.....	10 00
David Mahan, Lookout, O.....	Third.....	.....
U. G. Shetler, Wilmot, O.....	Second.	5 00
Geo. Ineichen, Celina, O.....
Same

J. L. Van Doren, Crestvue, O., *Expert Judge.*

ESSEX.

Owner's Name and Postoffice.	Name of Animal.	Premium.	Amount.
<i>Boar 1 year old or over.</i>			
Jos. A. Ineichen, Celina, O.....	.....	First.....	\$10 00
Geo. Ineichen, Celina, O.....	.....	Third.....	.....
D. E. Woodling, Beach City, O.....	Glenn II	Second.	5 00
<i>Boar under 1 year old.</i>			
Moore and McClain, Johnstown, O.....	.....	Second.	5 00
Geo. Ineichen, Celina, O.....	.....	First.....	10 00
D. E. Woodling, Beach City, O.....	Major McKinley.....	Third.....	.....
Same	Billy Bryan .....	.....	.....
<i>Sow 1 year old or over.</i>			
Moore and McClain, Johnstown, O.....	.....	.....	.....
Same .....	.....	.....	.....
Jos. A. Ineichen, Celina, O.....	.....	Third.....	.....
Geo. Ineichen, Celina, O.....	.....	.....	.....
D. E. Woodling, Beach City, O.....	Combination	First.....	10 00
Same	Royal Perfection.....	Second.	5 00
<i>Sow under 1 year old.</i>			
Moore and McClain, Johnstown, O.....	.....	First.....	10 00
Geo. Ineichen, Celina, O.....	.....	Second.	5 00
D. E. Woodling, Beach City, O.....	Beauty.....	Third.....	.....
Same	Beauty II.....	.....	.....

J. L. Van Doren, Crestvue, O., *Expert Judge.*

DUROC JERSEYS

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Boar 2 years old or over.</i>			
W. B. Cline, Camden, O.....	Cash Boy.....	First.....	\$10 00
<i>Boar 1 year old and under 2</i>			
W. B. Cline, Camden, O.....	King Lee	Third	
O. Walter & Bro., Lebanon, O.....	Nelson Chip	First.....	10 00
J. L. Wyley, Granville, O.....	Joe Hooker.....	Second	5 00
<i>Boar 6 months old and under 1 year.</i>			
W. B. Cline, Camden, O	Broadback Chief	Second.....	5 00
O. Walter & Bro., Lebanon, O.....	U. S. Wonder	First.....	8 00
<i>Boar under 6 months old.</i>			
W. B. Cline, Camden, O.....	By Consolation.....		
Same			
O. Walter & Bro., Lebanon, O.....			
E. S. Fawcett & Son, Chester Hill, O.....	Dandy.....	Second.....	3 00
J. L. Wyley, Granville, O.....		First.....	5 00
Same		Third	
<i>Boar and 3 sows over 1 year old.</i>			
W. B. Cline, Camden, O.....		Second	10 00
O. Walter & Bro., Lebanon, O.....	Nelson Chip.....	First.....	20 00
<i>Boar and 3 sows under 1 year old.</i>			
W. B. Cline, Camden, O.....			
O. Walter & Bro., Lebanon, O.....	U. S. Wonder.....	First.....	20 00
E. S. Fawcett & Son, Chester Hill, O.....		Third.....	
J. L. Wyley, Granville, O.....		Second.....	10 00
<i>Sow 2 years old or over.</i>			
W. B. Cline, Camden, Ohio.....	Olephia.....		
Same	Variety VI	Second	5 00
O. Walter & Bro., Lebanon, O.....	Lady Hubert	First.....	10 00
E. S. Fawcett & Son, Chester Hill, O.....	Lady Bates.....	Third.....	
<i>Sow 1 year old and under 2.</i>			
W. B. Cline, Camden, O.....	Beauty Spot I		
Same	Dutchess 31st.....	First.....	10 00
O. Walter & Bro., Lebanon, O.....	Lucy Duchess.....	Second.....	5 00
Same	Walters Blanche.....		
E. S. Fawcett & Son, Chester Hill, O.....		Third.....	
<i>Sow 6 months old and under 1 year.</i>			
W. B. Cline, Camden, O.....	Broadback II.....		
Same	Broadback III.....	Second.....	5 00
O. Walter & Bro., Lebanon, O.....	Bessie Wonder II.....	First.....	8 00
Same	Bessie Wonder III.....	Third.....	
E. S. Fawcett & Son, Chester Hill, O.....	Flossy.....		
Same			
<i>Sow under 6 months old.</i>			
W. B. Cline, Camden, O.....	By Prince of India		
Same		Third.....	
O. Walter & Bro., Lebanon, O.....			
J. L. Wyley, Granville, O.....		Second.....	3 00
Same		First.....	5 00
<i>4 Pigs under 6 months old.</i>			
W. B. Cline, Camden, O.....		Second.....	5 00
O. Walter & Bro., Lebanon, O.....			
J. L. Wyley, Granville, O.....		First	10 00

S. H. Todd, Wakeman, O., Expert Judge.

SWEEPSTAKES.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Berkshire boar.</i>			
L. C. Peterson, Spring Valley, O.....		First.....	\$10 00
O. P. Wolcott & Son, Conover, O.....			
R. Gentry, Danville, Ky.....			
Same.....			
J. D. Simms, Groveport, O.....	Quality.....		
Connell & Son, Fayette, O.....			
James Riley, Thorntown, Ind.....			
Same.....			
<i>Berkshire sow.</i>			
L. C. Peterson, Spring Valley, O.....		First.....	10 00
O. P. Wolcott & Son, Conover, O.....			
R. Gentry, Danville, Ky.....			
Same.....			
J. D. Simms, Groveport, O.....	Betsy.....		
Connell & Son, Fayette, O.....			
Jas. Riley, Thorntown, Ind.....			
D. E. Woodling, Beach City, O.....			
<i>Poland China boar.</i>			
Bounds Bros., Atherton, O.....			
Hiram Ingalls, Alton, O.....			
R. A. Kerr, South Warsaw, O.....	Treasurer U. S.....		
M. McConnell, Wakatomaka, O.....			
Ed. Klever Hadley & Hendrick, Wilmington, O.....		First.....	10 00
Same.....			
Robinson & Lovett, Piqua, C.....			
W. L. West, Marengo, O.....			
Bruce Bros., Chesterville, O.....	The Corker.....		
F. C. Lampe, Jeffersonville, O.....			
John Salmon, Madison Mills, O.....			
E. W. Morthland, Mansfield, O.....			
Pyers Bros. & Co., Nashville, O.....			
B. F. Dorsey & Sons, Perry, Ill.....			
Same.....			
<i>Poland China sow.</i>			
Ed. Klever Hadley & Hendrick, Wilmington, O.....			
Same.....			
Robinson & Lovett, Piqua, O.....			
A. N. Wiseley, Oakwood, O.....		First.....	10 00
W. L. West, Marengo, O.....			
Bruce Bros., Chesterville, O.....	U. S. Belle A.....		
John Salmon, Madison Mills, O.....			
E. W. Morthland, Mansfield, O.....			
Pyers Bros. & Co., Nashville, O.....			
B. F. Dorsey & Sons, Perry, Ill.....			
Same.....			
<i>Chester White boar.</i>			
P. T. Courter, Delaware, O.....			
B. P. Taylor, Marengo, O.....		First.....	10 00
L. H. Martin, Alexandria, O.....			
F. A. Branch, Medina, O.....			
U. G. Shetler, Wilmot, O.....			
E. S. Fawcett & Son, Chester Hill, O.....	Newark.....		
Pyers Bros. & Co., Nashville, O.....			
Wm. T. Dever, Lucasville, O.....			
<i>Chester White sow.</i>			
P. T. Courter, Delaware, O.....			
B. P. Taylor, Marengo, O.....			
L. H. Martin, Alexandria, O.....			
F. A. Branch, Medina, O.....		First.....	10 00
Same.....			
U. G. Shetler, Wilmot, O.....			
Wm. T. Dever, Lucasville, O.....			
J. L. Beringer, Marion, O.....			

SWEEPSTAKES—Continued.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
<i>Duroc Jersey Boar.</i>			
W. B. Cline, Camden, O.....	.....	First.....	\$10 00
Same	.....	.....	.....
O. Walter & Bro., Lebanon, O.....	Nelson Chip.....	.....	.....
Same	U. S. Wonder.....	.....	.....
E. S. Fawcett & Son, Chester Hill, O.....	Dandy.....	.....	.....
<i>Duroc Jersey Sow.</i>			
W. B. Cline, Camden, O.....	.....	.....	.....
O. Walter & Bro., Lebanon, O.....	Lady Hubert.....	.....	.....
Same	Lucy Duchess.....	First.....	10 00
Same	Bessie Wonder II.....	.....	.....
E. S. Fawcett & Son, Chester Hill, O.....	Lady Bates.....	.....	.....

L. C. Nixon, Fort Ancient, O., *Expert Judge.*

SPECIAL PREMIUM FOR POLAND-CHINA SWINE.

The Ohio Poland-China Record Co., through the Secretary, Carl Freigau, Dayton, Ohio, offered any six of the last issued eleven volumes (vi to xvii) of the Record for the best four Poland-China Pigs, over six months and under one year old. Certificate of registry, as issued by the Secretary of the Ohio Poland-China Record, to be filed with the entry for this prize.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
Ed. Klever Hadley & Hendrick, Wilmington, O.....
Bruce Bros., Chesterville, O.....	First.....	.....

L. C. Nixon, Fort Ancient, O., *Expert Judge*

SPECIAL PREMIUM.

The American Chester-White Record Association, through the Secretary, Carl Freigau, Dayton, Ohio, offers the five volumes of the Record for the best three Chester-White Pigs, over six months and under one year old.

Owner's Name and Post-office.	Name of Animal.	Premium.	Amount.
L. H. Martin, Alexandria, O.....	First.....	.....

L. C. Nixon, Fort Ancient, O., *Expert Judge.*

LIST OF AWARDS.

POULTRY—E. C. ELLIS, Member in Charge.

BARRED PLYMOUTH ROCK.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Chas. McClave, New London, O.....	Best cock.....	\$1 25
Chas. R. Craine, Springfield, O.....	2d ".....	75
I. O. Tritt, Urbana, O.....	Best cockerel.....	1 25
Chas. McClave, New London, O.....	2d ".....	75
Chas. Hopps & Co., Ashley, O.....	Best hen.....	1 25
Joe Farming, Flushing, O.....	2d ".....	75
Same.....	Best pullet.....	1 25
Chas. McClave, New London, O.....	2d ".....	75
Same.....	Best breeding pen.....	2 00
Chas. R. Craine, Springfield, O.....	2d ".....	1 00

WHITE PLYMOUTH ROCK.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
J. M. Linson, South Solon, O.....	Best cock.....	\$1 25
Same.....	2d ".....	75
Same.....	Best cockerel.....	1 25
Thomas Cony, New Carlisle, O.....	2d ".....	75
J. M. Linson, South Solon, O.....	Best hen.....	1 25
F. W. Lanfear & Son, Bedford, O.....	2d ".....	75
Thomas Cony, New Carlisle, O.....	Best pullet.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	75
J. M. Linson, South Solon, O.....	Best breeding pen.....	2 00
Chas. Gammerdinger, Columbus, O.....	2d ".....	1 00

WHITE WYANDOTTE.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
E. J. Haskins, Wakeman, O.....	Best cock.....	\$1 25
Frank Hartline, Strasburg, O.....	2d ".....	75
Chas. McClave, New London, O.....	Best cockerel.....	1 25
E. J. Haskins, Wakeman, O.....	2d ".....	75
J. R. Ross & Son, Level, O.....	Best hen.....	1 25
Chas. McClave, New London, O.....	2d ".....	75
Same.....	Best pullet.....	1 25
J. R. Ross & Son, Level, O.....	2d ".....	75
Chas. McClave, New London, O.....	Best breeding pen.....	2 00
E. J. Haskins, Wakeman, O.....	2d ".....	1 00

ENTRIES AND AWARDS.

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SILVER WYANDOTTE.

Owner's Name and Post-office	Kind of Fowl.	Premium.	Amount
C. P. Smith, Bedford, O.....	Best cock.....	First....	\$1 25
E. C. Fritch, Prospect, O.....	2d ".....	Second..	75
Same.....	Best cockerel.....	First....	1 25
Same.....	2d ".....	Second..	75
Chas. Gammerdinger, Columbus, O.....	Best hen.....	First....	1 25
J. R. Ross & Son, Level, O.....	2d ".....	Second..	75
E. C. Fritch, Prospect, O.....	Best pullet.....	First....	1 25
Same.....	2d ".....	Second..	75
Same.....	Best breeding pen.....	First....	2 00
Charles Gammerdinger, Columbus, O.....	2d ".....	Second..	1 00

GOLDEN WYANDOTTE.

Owner's Name and Post-office	Kind of Fowl.	Premium	Amount
S. B. McFarland, Sunbury, O.....	Best cock.....	First....	\$1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second..	75
S. B. McFarland, Sunbury, O.....	Best cockerel.....	First....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second..	75
Charles Gammerdinger, Columbus, O.....	Best hen.....	First....	1 25
S. B. McFarland, Sunbury, O.....	2d ".....	Second..	75
Frank E. White & Co., Marion, O.....	Best Pullet.....	First....	1 25
Same.....	2d ".....	Second..	75
Same.....	Best breeding pen.....	First....	2 00
S. B. McFarland, Sunbury, O.....	2d ".....	Second..	1 00

BLACK WYANDOTTE.

Owner's Name and Post-office.	Kind of Fowl.	Premium	Amount.
E. C. Fritch, Prospect, O.....	Best cock.....	First....	\$1 25
Same.....	2d ".....	Second..	75
Same.....	Best cockerel.....	First....	1 25
Same.....	2d ".....	Second..	75
Same.....	Best hen.....	First....	1 25
Same.....	2d ".....	Second..	75
Same.....	Best pullet.....	First....	1 25
Same.....	2d ".....	Second..	75

BLACK JAVA.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Chas. McClave, New London, O.....	Best cock.....	First....	\$1 25
Thomas Cony, New Carlisle, O.....	2d ".....	Second..	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel.....	First....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second..	75
Thomas Cony, New Carlisle, O.....	Best Hen.....	First....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second..	75
Same.....	Best pullet.....	First....	1 25
Same.....	2d ".....	Second..	75
Same.....	Best breeding pen.....	First....	2 00

WHITE JAVA.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock.....	\$1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	75
Same.....	Best cockerel.....	1 25
W. H. Standish, Lyons, O.....	Best hen.....	1 25
Chas. McClave New London, O.....	2d ".....	75
G. R. Baxter, Hillsdale, Mich.....	Best pullet.....	1 25
Chas. McClave, New London, O.....	2d ".....	75

LIGHT BRAHMA.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Chas. McClave, New London, O.....	Best cock.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
Same.....	Best cockerel.....	1 25
Same.....	2d ".....	75
Mrs. A. H. Mather, Wilmington, O.....	Best hen.....	1 25
Chas. McClave, New London, O.....	2d ".....	75
Mrs. A. H. Mather, Wilmington, O.....	Best pullet.....	1 25
Same.....	2d ".....	75
Same.....	Best breeding pen.....	2 00
Same.....	2d ".....	1 00

DARK BRAHMA.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock.....	\$1 25
John H. Shower, Basil, O.....	2d ".....	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel.....	1 25
John H. Shower, Basil, O.....	2d ".....	75
J. R. Ross & Son, Level, O.....	Best hen.....	1 25
Chas. McClave, New London, O.....	2d ".....	75
John H. Shower, Basil, O.....	Best pullet.....	1 25
Same.....	2d ".....	75
Same.....	Best breeding pen.....	2 00
Chas. Gammerdinger, Columbus, O.....	2d ".....	1 00

BUFF COCHIN.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
F. R. Hunt, Cleveland, O.....	Best cock.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
Same.....	Best cockerel.....	1 25
Same.....	2d ".....	75
J. R. Ross & Son, Level, O.....	Best hen.....	1 25
F. R. Hunt, Cleveland, O.....	2d ".....	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	1 25
Same.....	2d ".....	75
Same.....	Best breeding pen.....	2 00
F. R. Hunt, Cleveland, O.....	2d ".....	1 00

PARTRIDGE COCHIN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Chas. McClave, New London, O.....	Best cock.....	First	\$1 25
Same	2d	Second	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel	First	1 25
Chas. McClave, New London, O.....	2d	Second	75
Same	Best hen.....	First	1 25
Same	2d	Second	75
Same	Best pullet.....	First	1 25
Chas. Gammerdinger, Columbus, O.....	2d	Second	75
Chas. McClave, New London, O.....	Best breeding pen	First	2 00
Chas. Gammerdinger, Columbus, O.....	2d	Second	1 00

WHITE COCHIN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Frank Hartline, Strasburg, O	Best cock.....	First	\$1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second	75
Chas. Gammerdinger, Columbus, O	Best cockerel	First	1 25
S. E. Wurst, Elyria, O.....	2d	Second	75
Same	Best hen.....	First	1 25
Chas. Gammerdinger, Columbus, O.....	2d	Second	75
Same	Best pullet	First	1 25
Same	2d	Second	75

BLACK COCHIN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
G. R. Baxter, Hillsdale, Mich.....	Best cock.....	First	\$1 25
J. R. Ross & Son, Level, O.....	2d	Second	75
Same	Best hen.....	First	1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second	75

BLACK LANGSHAN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock	First	\$1 25
Chas. McClave, New London, O.....	2d	Second	75
Thomas Cony, New Carlisle, O.....	Best cockerel	First	1 25
Chas. Gammerdinger, Columbus, O.....	2d	Second	75
G. R. Baxter, Hillsdale, Mich.....	Best hen.....	First	1 25
Thomas Cony, New Carlisle, O.....	2d	Second	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	First	1 25
Thomas Cony, New Carlisle, O.....	2d	Second	75
Chas. Gammerdinger, Columbus, O.....	Best breeding pen.....	First	2 00
John H. Shower, Basil, O.....	2d	Second	1 00

S. C. BROWN LEGHORN.

Owner's Name and Post-office.	Name of Fowl.	Premium.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
Chas. McClave, New London, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Chas. McClave, New London, O.....	Best hen.....	First.....	1 25
F. W. Lanfear & Son, Bedford, O.....	2d ".....	Second.....	75
Stephen A. Kistler, Newton Falls, O.....	Best pullet.....	First.....	1 25
Chas. McClave, New London, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best breeding pen.....	First.....	2 00
R. D. Bohannon, Columbus, O.....	2d ".....	Second.....	1 00

R. C. BROWN LEGHORN.

Owner's Name and Post-office.	Name of Fowl.	Premium.	Amount.
Thomas Cony, New Carlisle, O.....	Best cock.....	First.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same	Best cockerel.....	First.....	1 25
Thomas Cony, New Carlisle, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best hen.....	First.....	1 25
Same	2d ".....	Second.....	75
Same	Best pullet.....	First.....	1 25
Same	2d ".....	Second.....	75
Same	Best breeding pen.....	First.....	2 00

S. C. WHITE LEGHORN.

Owner's Name and Post-office.	Name of Fowl.	Premium.	Amount.
Thomas Cony, New Carlisle, O.....	Best cock.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
Arthur H. Powell, Newark, O.....	2d ".....	Second.....	75
C. W. McFarland, Iberia, O.....	Best hen.....	First.....	1 25
M. M. Myers, New Dover, O.....	2d ".....	Second.....	75
Thomas Cony, New Carlisle, O.....	Best pullet.....	First.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same	Best breeding pen.....	First.....	2 00

R. C. WHITE LEGHORN.

Owner's Name and Post-office.	Name of Fowl.	Premium.	Amount.
S. E. Wurst, Elyria, O.....	Best cock.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	Second.....	75
Same	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Same	Best hen.....	First.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same	Best pullet.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75

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BLACK LEGHORN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
G. R. Baxter, Hillsdale, Mich.....	Best cock.....	First.....	\$1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Same.....	Best cockerel.....	First.....	1 25
Frank Hartline, Strasburg, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best hen.....	First.....	1 25
Chas. McClave, New London, O.....	2d ".....	Second.....	75
Frank Hartline, Strasburg, O.....	Best pullet.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	Second.....	75

BUFF LEGHORN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
Robert Bell, Ashley, O.....	2d ".....	Second.....	75
Same.....	Best cockerel.....	First.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Robert Bell, Ashley, O.....	Best hen.....	First.....	1 25
Same.....	2d ".....	Second.....	75
Carl W. Smith, Newton Falls, O.....	Best pullet.....	First.....	1 25
Same.....	2d ".....	Second.....	75
Robert Bell, Ashley, O.....	Best breeding pen.....	First.....	2 00
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	1 00

BLACK MINORCA.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
J. R. Ross & Son, Level, O.....	Best cock.....	First.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Chas. McClave, New London, O.....	Best cockerel.....	First.....	1 25
J. R. Ross & Son, Level, O.....	2d ".....	Second.....	75
Same.....	Best hen.....	First.....	1 25
F. R. Hunt, Cleveland, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	First.....	1 25
Frank Hartline, Strasburg, O.....	2d ".....	Second.....	75
J. R. Ross & Son, Level, O.....	Best breeding pen.....	First.....	2 00
F. R. Hunt, Cleveland, O.....	2d ".....	Second.....	1 00

BLACK SPANISH.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Henry G. Huber, Dayton, O.....	Best cock.....	First.....	\$1 25
J. R. Ross & Son, Level, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
J. R. Ross & Son, Level, O.....	Best hen.....	First.....	1 25
Frank Hartline, Strasburg, O.....	2d ".....	Second.....	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	First.....	1 25
Same.....	2d ".....	Second.....	75
Same.....	Best breeding pen.....	First.....	2 00

W. C. BLACK POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
S. E. Wurst, Elyria, O.....	Best cock	\$1 25
Chas. McClave, New London, O.....	2d "	75
Same	Best cockerel.....	1 25
Mrs. E. Gammerdinger, Columbus, O.....	2d "	75
Same	Best hen.....	1 25
Chas. McClave, New London, O.....	2d "	75
Same	Best pullet.....	1 25
Same	2d "	75
Mrs. E. Gammerdinger, Columbus, O.....	Best breeding pen.....	2 00

PLAIN SILVER POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Mrs. E. Gammerdinger, Columbus, O.....	Best cock	1 25
Same	2d "	75
Same	Best cockerel.....	1 25
Same	2d "	75
Same	Best hen.....	1 25
Same	2d "	75
Same	Best pullet.....	1 25
Same	2d "	75
Same	Best breeding pen.....	2 00

PLAIN WHITE POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
S. E. Wurst, Elyria, O.....	Best cock	1 25
Mrs. E. Gammerdinger, Columbus, O.....	2d "	75
S. E. Wurst, Elyria, O.....	Best cockerel.....	1 25
Mrs. E. Gammerdinger, Columbus, O.....	2d "	75
Same	Best hen.....	1 25
S. E. Wurst, Elyria, O.....	2d "	75
Mrs. E. Gammerdinger, Columbus, O.....	Best pullet.....	1 25
Same	2d "	75
W. H. Standish, Lyons, O.....	Best breeding pen.....	2 00
Mrs. E. Gammerdinger, Columbus, O.....	2d "	1 00

PLAIN GOLDEN POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Ed. C. Fletcher, Wakeman, O.....	Best cock.....	1 25
Mrs. E. Gammerdinger, Columbus, O.....	2d "	75
Same	Best cockerel.....	1 25
Same	2d "	75
Same	Best hen.....	1 25
Ed. C. Fletcher, Wakeman, O.....	2d "	75
Mrs. E. Gammerdinger, Columbus, O.....	Best pullet.....	1 25
Same	2d "	75
Same	Best breeding pen.....	2 00
Ed. C. Fletcher, Wakeman, O.....	2d "	1 00

BEARDED GOLDEN POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Mrs. E. Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
Mrs. E. Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
Same	Best hen.....	First.....	1 25
Same	2d	Second.....	75
Same	Best pullet.....	First.....	1 25
Same	2d	Second.....	75
Same	Best breeding pen.....	First.....	2 00

BEARDED SILVER POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Chas McClave, New London, O.....	Best cock.....	First.....	25
Mrs. E. Gammerdinger, Columbus, O.....	2d	Second.....	75
Same	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
Mrs. E. Gammerdinger, Columbus, O.....	Best hen.....	First.....	1 25
Same	2d	Second.....	75
Same	Best pullet.....	First.....	1 25
Same	2d	Second.....	75
Same	Best breeding pen.....	First.....	2 00

BEARDED WHITE POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Mrs. E. Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second.....	75
Mrs. E. Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
Same	2d	Second.....	75
Same	Best hen.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second.....	75
Mrs. E. Gammerdinger, Columbus, O.....	Best pullet.....	First.....	1 25
Same	2d	Second.....	75
Same	Best breeding pen.....	First.....	2 00

BUFF LACED POLISH.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
G. R. Baxter, Hillsdale, Mich.....	Best cock.....	First.....	\$1 25
Same	Best hen.....	First.....	1 25
Mrs. E. Gammerdinger, Columbus, O.....	Best pullet.....	First.....	1 25

AGRICULTURAL REPORT.

GOLDEN SPANGLED HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Thomas Cony, New Carlisle, O.....	Best cock.....	First.....	\$1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Charles Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
Charles McClave, New London, O.....	2d ".....	Second.....	75
J. R. Ross & Son, Level O.....	Best hen.....	First.....	1 25
Charles McClave, New London, O.....	2d ".....	Second.....	75
Charles McClave, New London, O.....	Best pullet.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	Second.....	75
Charles McClave, New London, O.....	Best breeding pen.....	First.....	2 00
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	1 00

SILVER SPANGLED HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
C. W. McFarland, Iberia, O.....	Best cock.....	First.....	\$1 25
E. J. Haskin, Wakeman, O.....	2d ".....	Second.....	75
C. G. Wherry, Galena, O.....	Best cockerel.....	First.....	1 25
Same	2d ".....	Second.....	75
Same	Best hen.....	First.....	1 25
C. W. McFarland, Iberia, O.....	2d ".....	Second.....	75
C. G. Wherry, Galena, O.....	Best pullet.....	First.....	1 25
Same	2d ".....	Second.....	75
Same	Best breeding pen.....	First.....	2 00
C. W. McFarland, Iberia, O.....	2d ".....	Second.....	1 00

GOLDEN PENCILED HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles McClave, New London, O.....	Best cock.....	First.....	\$1 25
J. W. Ross & Son, Level, O.....	Best hen.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75

SILVER PENCILED HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	Second.....	75
Charles McClave, New London, O.....	Best cockerel.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	Best hen.....	First.....	1 25
Same	2d ".....	Second.....	75
Charles McClave, New London, O.....	Best pullet.....	First.....	1 25

BLACK HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premiums.	Amount.
Charles McClave, New London, O.....	Best cock.....	First.....	\$1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
Charles McClave, New London, O.....	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
J. R. Ross & Son, Level, O.....	Best hen.....	First.....	1 25
J. F. Lutz, Amanda, O.....	2d	Second.....	75
G. R. Baxter, Hillsdale, Mich.....	Best pullet.....	First.....	1 25
Same	2d	Second.....	75

WHITE HAMBURG.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
J. R. Ross & Son, Level, O.....	Best cock.....	First.....	\$1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second.....	75
Frank Hartline, Strasburg, O.....	Best cockerel.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	Second.....	75
G. R. Baxter, Hillsdale, Mich.....	Best hen	First.....	1 25
J. R. Ross & Son, Level O.....	2d	Second.....	75
Frank Hartline, Strasburg, O.....	Best pullet	First.....	1 25

RED-CAP.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles McClave, New London, O.....	Best cock.....	First.....	\$1 25
Thomas Cony, New Carlisle, O.....	2d	Second.....	75
Charles Gammerdinger, Columbus, O.....	Best cockerel.....	First.....	1 25
Thomas Cony, New Carlisle, O.....	2d	Second.....	75
Charles McClave, New London, O.....	Best hen.....	First.....	1 25
Frank Hartline, Strasburg, O.....	2d	Second.....	75
Charles Gammerdinger, Columbus, O.....	Best pullet	First.....	1 25
Same	2d	Second.....	75

HOUDAN.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles Gammerdinger, Columbus, O.....	Best cock.....	First.....	\$1 25
Charles Hopps & Co., Ashley, O.....	2d	Second.....	75
Same	Best cockerel.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	Second.....	75
Charles Hopps & Co., Ashley, O.....	Best hen.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	Second.....	75
Charles Hopps & Co., Ashley O.....	Best pullet.....	First.....	1 25
Charles Gammerdinger, Columbus O.....	2d	Second.....	75
Charles Hopps & Co., Ashley, O.....	Best breeding pen.....	First.....	2 00
Charles Gammerdinger, Columbus, O.....	2d	Second.....	1 00

CREVECOEUR.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
S. E. Wurst, Elyria, O.....	Best cock.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
Same.....	Best cockerel.....	1 25
Same.....	2d ".....	75
Same.....	Best hen.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	1 25
Same.....	2d ".....	75
Same.....	Best breeding pen.....	2 00

LA FLECHE.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Chas. Gammerdinger, Columbus, O.....	Best cock.....	\$1 25
Same.....	Best cockerel.....	1 25
Same.....	2d ".....	75
Same.....	Best hen.....	1 25
Same.....	2d ".....	75
Same.....	Best pullet.....	1 25
Same.....	2d ".....	75

SILVER GREY DORKING.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
J. R. Ross & Son, Level, O.....	Best cock.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
S. E. Wurst, Elyria, C.....	Best cockerel.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
J. R. Ross & Son, Level, O.....	Best hen.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
Frank Hartline, Strasburg, O.....	Best pullet.....	1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75

COLORED DORKING.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
G. R. Baxter, Hillsdale, Mich.....	Best cock.....	\$1 25
Chas. Gammerdinger, Columbus, O.....	2d ".....	75
Same.....	Best cockerel.....	1 25
G. R. Baxter, Hillsdale, Mich.....	Best hen.....	1 25
Same.....	2d ".....	75
Chas. Gammerdinger, Columbus, O.....	Best pullet.....	1 25

WHITE DORKING.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
G. R. Baxter, Hillsdale, Mich.....	Best cock.....	First.....	\$1 25
M. M. Myers, New Dover, O.....	2d ".....	Second.....	75
Same.....	Best hen.....	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	Second.....	75

BLACK BREASTED RED GAME.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
M. M. Myers, New Dover, O.....	Best cock.....	First.....	\$1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Same.....	Best cockerel.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same.....	Best hen.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	Second.....	75
Same.....	Best pullet.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same.....	Best breeding pen.....	First.....	2 00

SUMATRA GAME.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
M. M. Myers, New Dover, O.....	Best cock.....	First.....	\$1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
Same.....	Best cockerel.....	First.....	1 25
Same.....	2d ".....	Second.....	75
S. E. Wurst, Elyria, O.....	Best hen.....	First.....	1 25
J. F. Lutz, Amanda, O.....	2d ".....	Second.....	75
Charles Gammerdinger, Columbus, O.....	Best pullet.....	First.....	1 25
M. M. Myers, New Dover, O.....	2d ".....	Second.....	75
Charles Gammerdinger, Columbus, O.....	Best breeding pen.....	First.....	2 00

GOLDEN DUCK-WING GAME.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
S. E. Wurst, Elyria, O.....	Best cock.....	First.....	\$1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
S. E. Wurst, Elyria, O.....	Best cockerel.....	First.....	1 25
Same.....	Best hen.....	First.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	Second.....	75
S. E. Wurst, Elyria, O.....	Best pullet.....	First.....	1 25

(AGRICULTURAL REPORT.)

SILVER DUCK-WING GAME.

Owner's Name and Post-office.	Kind of Fowl	Amount.
Charles Gammerdinger, Columbus, O.....	Best cock.....	\$1 25
S. E. Wurst, Elyria, O.....	2d	75
Same	Best cockerel.....	1 25
Same	Best hen.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	75
S. E. Wurst, Elyria, O.....	Best pullet.....	1 25

RED PILE GAME.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Charles Gammerdinger, Columbus, O.....	Best cock.....	\$1 25
Thomas Conry, New Carlisle, O.....	2d	75
S. E. Wurst, Elyria, O.....	Best cockerel.....	1 25
Thomas Conry, New Carlisle, O.....	Best hen.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	75
S. E. Wurst, Elyria, O.....	Best pullet.....	1 25

CORNISH INDIAN GAME.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Charles McClave, New London, O.....	Best cock.....	\$1 25
Warren J. Arthur, Beatty, O.....	2d	75
Same	Best cockerel.....	1 25
Same	2d	75
Charles McClave, New London, O.....	Best hen.....	1 25
Warren J. Arthur, Beatty, O.....	2d	75
Charles McClave, New London, O.....	Best pullet.....	1 25
Warren J. Arthur, Beatty, O.....	2d	75
Charles McClave, New London, O.....	Best breeding pen.....	2 00
Warren J. Arthur, Beatty, O.....	2d	1 00

PIT GAME.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
S. E. Wurst, Elyria, O.....	Best cock.....	\$1 25
Arthur H. Powell, Newark, O.....	2d	75
Same	Best cockerel.....	1 25
Same	2d	75
S. E. Wurst, Elyria, O.....	Best hen.....	1 25
Arthur H. Powell, Newark, O.....	2d	75
Same	Best pullet.....	1 25
Same	2d	75

B. B. R. BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Charles McClave, New London, O.....	Best cock.....	\$1 25
L. Rottman, Benton, O.....	2d ".....	75
Same.....	Best cockerel.....	1 25
Charles McClave, New London, O.....	2d ".....	75
McMichael, Bedford, O.....	Best hen.....	1 25
L. Rottman, Benton, O.....	2d ".....	75
Same.....	Best pullet.....	1 25
Same.....	2d ".....	75

GOLDEN DUCK-WING BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
L. Rottman, Benton, O.....	Best cock.....	\$1 25
E. J. Haskins, Wakeman, O.....	2d ".....	75
L. Rottman, Benton, O.....	Best cockerel.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	75
J. F. Lutz, Amanda, O.....	Best hen.....	1 25
L. Rottman, Benton, O.....	2d ".....	75
Same.....	Best pullet.....	1 25
Charles Gammerdinger, Columbus, O.....	2d ".....	75

SILVER DUCK-WING BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
J. R. Ross and Son, Level, O.....	Best cock.....	\$1 25
Thomas Cony, New Carlisle, O.....	2d ".....	75
S. E. Wurst, Elyria, O.....	Best cockerel.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	75
E. J. Haskins, Wakeman, O.....	Best hen.....	1 25
S. E. Wurst, Elyria, O.....	2d ".....	75
Same.....	Best pullet.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d ".....	75

RED PILE BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
L. Rottman, Benton, O.....	Best cock.....	\$1 25
J. H. Cole, Berkshire, O.....	2d ".....	75
L. Rottman, Benton, O.....	Best cockerel.....	1 25
Same.....	2d ".....	75
Same.....	Best hen.....	1 25
J. H. Cole, Berkshire, O.....	2d ".....	75
L. Rottman, Benton, O.....	Best pullet.....	1 25
Same.....	2d ".....	75

AGRICULTURAL REPORT.

GOLDEN SEABRIGHT BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
J. R. Ross & Son, Level, O.....	Best cock.....	\$1 25
Charles McClave, New London, O.....	2d	75
Same	Best cockerel.....	1 25
S. E. Wurst, Elyria, O.....	2d	75
L. Rottman, Benton, O.....	Best hen.....	1 25
Same	2d	75
Charles McClave, New London, O.....	Best pullet.....	1 25
L. Rottman, Benton, O.....	2d	75
Same	Best breeding pen.....	2 00
Charles McClave, New London, O.....	2d	1 00

SILVER SEABRIGHT BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
L. Rottman, Benton, O.....	Best cock.....	\$1 25
Charles Gammerdinger, Columbus, O.....	2d	75
L. Rottman, Benton, O.....	Best cockerel.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	75
L. Rottman, Benton, O.....	Best hen.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	75
L. Rottman, Benton, O.....	Best pullet.....	1 25
Thomas Cony, New Carlisle, O.....	2d	75
L. Rottman, Benton, O.....	Best breeding pen.....	2 00
Charles Gammerdinger, Columbus, O.....	2d	1 00

BUFF COCHIN BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
J. M. Linson, South Solon, O.....	Best cock.....	\$1 25
L. Rottman, Benton, O.....	2d	75
Same	Best cockerel.....	1 25
Same	2d	75
Same	Best hen.....	1 25
E. E. Fritch, Prospect, O.....	2d	75
L. Rottman, Benton, O.....	Best pullet.....	1 25
E. E. Fritch, Prospect, O.....	2d	75
Same	Best breeding pen.....	2 00
Charles McClave, New London, O.....	2d	1 00

WHITE ROSE COMBED BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
S. E. Wurst, Elyria, O.....	Best cock.....	\$1 25
Charles Gammerdinger, Columbus, O.....	2d	75
Thomas Cony, New Carlisle, O.....	Best hen.....	1 25
Charles Gammerdinger, Columbus, O.....	2d	75
S. E. Wurst, Elyria, O.....	Best pullet.....	1 25
Thomas Cony, New Carlisle, O.....	2d	75

ENTRIES AND AWARDS.

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BLACK ROSE COMBED BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles McClave, New London, O.....	Best cock.....	First.....	\$1 25
L. Rottman, Benton, O.....	2d	Second.....	75
Same	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
Charles McClave, New London, O.....	Best hen.....	First.....	1 25
L. Rottman, Benton, O.....	2d	Second.....	75
Same	Best pullet.....	First.....	1 25
Charles McClave, New London, O.....	2d	Second.....	75

JAPANESE BANTAM.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles McClave, New London, O.....	Best cock.....	First.....	\$1 25
Same	2d	Second.....	75
G. W. Baxter, Hillsdale, Mich.....	Best cockerel.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75
Charles McClave, New London, O.....	Best hen	First.....	1 25
G. R. Baxter, Hillsdale, Mich.....	2d	Second.....	75
Same	Best pullet.....	First.....	1 25
S. E. Wurst, Elyria, O.....	2d	Second.....	75

TURKEYS.

Owner's Name and Post-office.	Kind of Fowl.	Premium.	Amount.
Charles McClave, New London, O.....	Best bronze turkey, old pair.	First.....	\$2 00
S. E. Wurst, Elyria, O.....	2d	Second.....	1 00
Charles McClave, New London, O.....	Best bronze turkey, y'g pr...	First.....	2 00
J. F. Lutz, Amanda, O.....	2d	Second.....	1 00
S. E. Wurst, Elyria, O.....	Best white turkey, old pair..	First.....	2 00
Thomas Cony, New Carlisle, O.....	2d	Second.....	1 00
J. F. Lutz, Amanda, O.....	Best white turkey, young pr.	First.....	2 00
M. M. Myers, New Dover, O.....	Best buff turkey, old pair.....	First.....	2 00
J. R. Ross & Son, Level, O.....	2d	Second.....	1 00
G. R. Baxter, Hillsdale, Mich.....	Best buff turkey, young pair.	First.....	2 00
M. M. Myers, New Dover, O.....	2d	Second.....	1 00
G. R. Baxter, Hillsdale, Mich.....	Best Nar'g'nset t'rky old pr.	First.....	2 00
J. F. Lutz, Amanda, O.....	2d	Second.....	1 00
C. W. McFarland, Iberia, O.....	Best Nar'g'nset t'rky y'g pr.	First.....	2 00
M. M. Myers, New Dover, O.....	2d	Second.....	1 00
Charles McClave, New London, O.....	Best black turkey old pair...	First.....	2 00
S. E. Wurst, Elyria, O.....	2d	Second.....	1 00
Charles McClave, New London, O.....	Best black turkey, young pr...	First.....	2 00
M. M. Myers, New Dover, O.....	2d	Second.....	1 00
J. R. Ross & Son, Level, O.....	Best slate turkey, old pair...	First.....	2 00
Charles McClave, New London, O.....	2d	Second.....	1 00
J. F. Lutz, Amanda, O.....	Best slate turkey, young pr.	First.....	2 00

DUCKS.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
Charles McClave, New London, O.	Best Pekin, old pair.....	\$2 00
Charles Gammerdinger, Columbus, O.....	2d "	1 00
Robert Bell, Ashley, O.....	Best Pekin, young pair.....	2 00
Charles McClave, New London, O.....	2d "	1 00
Same	Best Aylesbury, old pair	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
W. H. Standish, Lyons, O.....	Best " " young pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
Same	Best Rouen, old pair....	2 00
Charles McClave, New London, O.....	2d "	1 00
Charles Gammerdinger, Columbus, O.....	Best " " young pair.....	2 00
W. H. Standish, Lyons, O.....	2d "	1 00
M. M. Myers, New Dover, O.....	Best Cayuga, old pair.....	2 00
S. E. Wurst, Elyria, O.....	2d "	1 00
M. M. Myers, New Dover, O.....	Best " " young pair.....	2 00
J. F. Lutz, Amanda, O.....	2d "	1 00
S. E. Wurst, Elyria, O.....	Best Crested white, old pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
Charles Gammerdinger, Columbus, O.....	Best " " " young pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
Same	Best Gray call, old pair.....	2 00
Charles Gammerdinger, Columbus, O.....	2d "	1 00
Charles McClave, New London, O.....	Best " " " young pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
J. H. Cole, Berkshire, O.....	Best White call, old pair.....	2 00
J. F. Lutz, Amanda, O.....	2d "	1 00
M. M. Myers, New Dover, O.....	Best " " " young pair.....	2 00
S. E. Wurst, Elyria, O.....	2d "	1 00
S. E. Wurst, Elyria, O.....	Best Muscovy, col, old pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
Charles Gammerdinger, Columbus, O.....	Best " " " young pair.....	2 00
Charles McClave, New London, O.....	2d "	1 00
Same	Best Muscovy, white, old pr	2 00
G. R. Baxter, Hillsdale, Mich	2d "	1 00
Frank Hartline, Strasburg, O.....	Best " " " y'g pr.....	2 00
W. H. Standish, Lyons, O.....	2d "	1 00

GESE.

Owner's Name and Post-office.	Kind of Fowl.	Amount.
M. M. Myers, New Dover, O.....	Best Toulouse, old pair.....	\$2 00
Charles McClave, New London, O.....	2d "	1 00
Same	Best " " young pair.....	2 00
E. J. Haskins, Wakeman, O.....	2d "	1 00
Frank Hartline, Strasburg, O.....	Best Embden, old pair.....	2 00
J. F. Lutz, Amanda, O.....	2d "	1 00
W. H. Standish, Lyons, O.....	Best " " young pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
J. H. Cole, Berkshire, O.....	Best African, old pair.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
Charles McClave, New London, O.....	Best brown Chinese, old pr.....	2 00
S. E. Wurst, Elyria, O.....	2d "	1 00
Charles McClave, New London, O.....	Best " " " young pr.....	2 00
M. M. Myers, New Dover, O.....	2d "	1 00
J. H. Ross & Son, Level, O.....	Best white, old pair.....	2 00
J. F. Lutz, Amanda, O.....	2d "	1 00
Charles McClave, New London, O.....	Best " " young pair.....	2 00
J. F. Lutz, Amanda, O.....	2d "	1 00

PIGEONS.

Owner's Name and Post-office.	Name of Animal.	Amount.
J. Copeutt, Columbus, O.....	Best collection of pigeons five varieties, in pairs.....	5 00
Phillip Office, Columbus, O.....	Second best collection of pigeons, five varieties in pairs.....	3 00

CLASS COLLECTIONS.

Owner's Name and Post-office.	Name of Animal.	Amount.
E. E. Fritch, Prospect O.....	Finest collection in American class	\$ 3 00
Charles Gammerdinger, Columbus, O.....	Finest collection in Asiatic class.....	3 00
Same	Finest collection in Mediterranean class.....	3 00
Mrs. E. Gammerdinger, Columbus, O.....	Finest collection in Polish class.....	3 00
Mrs. Charles McClave, New London, O.....	Finest collection in Hamburg class	3 00
Charles Gammerdinger, Columbus, O.....	Finest collection in Games and Game Bantams.....	3 00
L. Rottman, Benton, O.....	Finest collection in Bantams not games.....	3 00
Charles McClave, New London, O.....	Finest collection of Turkeys.....	3 00
M M. Myers, New Dover, O.....	Finest collection of Water Fowls.....	3 00
Charles Gammerdinger, Columbus, O.....	Largest collection and greatest variety of Poultry.....	Medal
Mascotte Incubator Co., Bedford, O.....	Best Incubator in operation.....	Medal
Same	Best Brooder in operation.....	Medal

FARM PRODUCTS—ALBERT HALE, Member in charge.
GRAIN, SEEDS AND CEREAL MILL PRODUCTS.

Owner's Name and Post-office.	Name of Article.	Amount.
H. Bookwalter, Hallsville, O.....	Best 20 lbs. buckwheat flour.....	\$ 2 00
W. D. Whipps, Marion, O.....	Best ½ bu. white winter wheat.....	3 00
F. M. Whipps, Byhalia, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " long-berried "	3 00
W. D. Whipps, Marion, O.....	2d	2 00
F. M. Whipps, Byhalia, O.....	Best " other variety "	3 00
W. D. Whipps, Marion, O.....	2d	2 00
Same	Best " any var. Amber "	3 00
J. L. Keckley, Marysville, O.....	2d	2 00
Same	Best " winter rye.....	3 00
F. M. Whipps, Byhalia, O.....	2d	2 00
I. B. Keckley, Marysville, O.....	Best " black oats.....	3 00
J. L. Keckley, Same	2d	2 00
Same	Best " white oats.....	3 00
F. M. Whipps, Byhalia, O.....	2d	2 00
L. M. Gregg, Springboro, O.....	Best " winter barley.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
F. M. Whipps, Byhalia, O.....	Best " spring barley.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " silv'r-hull buckw't.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " Japanese buckw't.....	3 00
D. T. Corwin, Springboro, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " Russian flax seed.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
D. F. Corwin, Springboro, O.....	Best " common flax seed.....	3 00
J. L. Keckley, Marysville, O.....	2d	2 00
W. D. Whipps, Marion, O.....	Best " timothy seed.....	3 00
M. J. Leavitt, Mechanicsburg, O.....	2d	2 00
D. F. Corwin, Springboro, O.....	Best " Ky. blue grass seed.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
D. F. Corwin, Springboro, O.....	Best " large Eng. clover seed.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
D. F. Corwin, Springboro, O.....	Best " red clover seed.....	3 00
M. J. Leavitt, Mechanicsburg, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " orchard grass seed.....	3 00
W. D. Whipps, Marion, O.....	2d	2 00
F. M. Whipps, Byhalia, O.....	Best " millet, seed	3 00
W. D. Whipps, Marion, O.....	2d	2 00
J. L. Keckley, Marysville, O.....	Best " Hungarian grass seed.....	3 00
Albert Pierce, North Ridgeville, O.....	2d	2 00
D. F. Corwin, Springboro, O.....	Best ½ pk. Lima beans, dry.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	2d	1 00
Arthur H. Powell, Newark, O.....	Best 1 pk. marrow-fat beans, dry.....	2 00
J. L. Keckley, Marysville, O.....	2d	1 00
Arthur H. Powell, Newark, O.....	Best " navy beans.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	2d	1 00
I. B. Keckley, Marysville, O.....	Best ¼ pk. wht. marrow-fat field peas, dry.....	2 00
Albert Pierce, North Ridgeville, O.....	2d ¼ pk. white marrow-fat field peas, dry.....	1 00
J. L. Keckley, Marysville, O.....	Best ½ pk. Canada field peas dry.....	2 00
W. D. Whipps, Marion, O.....	2d best ¼ pk. Canada field peas, dry.....	1 00
J. L. Keckley, Marysville, O.....	Best display grain in straw and threshed, not less than ½ peck each.....	5 00
D. F. Corwin, Springboro, O.....	2d best display grain in straw and threshed, not less than ½ peck each.....	3 00
L. M. Gregg, Springboro, O.....	Best four hands Ohio seed leaf tobacco.....	3 00
D. F. Corwin, Springboro, O.....	2d best four hands Ohio seed leaf tobacco.....	2 00
Same	Best four hands white Burley tobacco.....	3 00
L. M. Gregg, Springboro, O.....	2d best four hands white Burley tobacco.....	2 00
D. F. Corwin, Springboro, O.....	Best four hands Little Dutch tobacco.....	3 00
L. M. Gregg, Springboro, O.....	2d best four hands Little Dutch tobacco.....	2 00
J. L. Keckley, Marysville, O.....	Best variety and arrangement garden, field and grass seeds prof. seedsmen.....	5 00

CORN, ETC.

Owner's Name and Post-office.	Name of Article.	Amount.
J. L. Keckley, Marysville, O.....	Best display yellow corn in variety, both husked and on stalk, properly named, and labeled. Of husked and not less than ten ears each variety.....	\$5 00
D. F. Corwin, Springboro, O.....	2d best.....	3 00
Same.....	Best same white.....	5 00
J. L. Keckley, Marysville, O.....	2d ".....	3 00
W. D. Whipps, Marion, O.....	Best same sweet.....	3 00
A. H. Powell, Newark, O.....	2d ".....	2 00
J. L. Keckley, Marysville, O.....	Best same pop.....	3 00
H. Bookwalter Hallsville, O.....	2d ".....	2 00
F. M. Whipps, Byhalia, O.....	Best specimen dried corn not less than one peck.....	2 00
L. M. Gregg, Springboro, O.....	Best twenty pounds broom corn with or without seed.....	3 00
D. F. Corwin, Springboro, O.....	2d " ".....	2 00

CHEESE AND BUTTER.

Owner's Name and Post-office.	Name of Article.	Amount.
Italy Bros., Columbus, O.....	Best and largest disp. not less than twenty cheeses.....	\$15 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	Best pkg. of dairy butter.....	5 00
Same.....	Best exhibit of dairy butter qual. and quan. considered.....	8 00
Abner W. Graham, Reynoldsburg, O.....	2d ".....	5 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	Best exhibition creamery butter, quality and quantity considered.....	8 00
Abner W. Graham, Reynoldsburg, O.....	2d ".....	5 00

POTATOES AND OTHER ROOT PRODUCTS.

Owner's Name and Post-office.	Name of Article.	Amount.
J. L. Keckley, Marysville, O.....	Best peck American Giant Potatoes.....	\$2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best peck Alex. Prolific.....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00
Same.....	Best peck Beauty of Hebron.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	2d ".....	1 00
Same.....	Best peck Burbank Seedling.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best peck Badger State.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best peck Brownell's Best.....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
L. M. Gregg, Springboro, O.....	Best one peck Banner.....	2 00
Albert Pierce, North Ridgeville, O.....	2d ".....	1 00
E. G. Stockman, Prospect, O.....	Best peck Bliss Triumph.....	2 00
O. C. Stockman, Prospect, O.....	2d ".....	1 00
Ambrose C. Ford, Fishers, Ontario Co, N. Y.....	Best peck Buckeye State.....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best one peck Clark's No. 1.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
E. G. Stockman, Prospect, O.....	Best peck Chicago Market.....	2 00
L. M. Gregg, Springboro, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best peck Dunmore Seedling.....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best one peck Early Rose.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best one peck Early Ohio.....	2 00
F. M. Whipps, Byhalia, O.....	2d " ".....	1 00

POTATOES AND OTHER ROOT PRODUCTS.

Owner's Name and Post-office.	Name of Article.)	Amount.
J. L. Keckley, Marysville, O.....	Best pk. Early Puritan potatoes.....	\$2 00
Albert Pierce, North Ridgeville, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Early Mayflower ".....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
F. M. Whipps, Byhalia, O.....	Best pk. Empire State ".....	2 00
E. G. Stockman, Prospect, O.....	2d ".....	1 00
Same.....	Best pk. Freeman ".....	2 00
O. C. Stockman, Prospect, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best pk. Jumbo ".....	2 00
Chas. W. Ford, Morristown, N. J.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Green Mountain ".....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Lee's Favorite ".....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Mammoth Pearl ".....	2 00
C. G. Stockman, Prospect, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Potentate ".....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Polaris ".....	2 00
E. G. Stockman, Prospect, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Queen of the Valley ".....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
L. M. Gregg, Springboro, O.....	Best pk Rural N. Yorker No. 2 ".....	2 00
H. H. Knox, Pulaski, Pa.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Seneca Beauty ".....	2 00
H. H. Knox, Pulaski, Pa.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Victor ".....	2 00
H. H. Knox, Pulaski, Pa.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. Vaughn ".....	2 00
Charles W. Ford, Morristown, N. J.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best pk. White Elephant ".....	2 00
W. D. Whipps, Marysville, O.....	2d ".....	1 00
M. J. Leavitt, Mechanicsburg, O.....	Best pk. White Star ".....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best peck new variety, introduced and exhibited for first time in '96, properly named and labeled.....	3 00
Chas. W. Ford, Morristown, N. J.....	2d ".....	2 00
F. M. Whipps, Byhalia, O.....	Best display and variety, Irish po- tatoes 1 peck each named and labeled.....	15 00
E. G. Stockman, Prospect, O.....	2d ".....	10 00
E. S. Tussing, Canal Winchester, O.....	Best pk. yellow sweet potatoes.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
E. S. Tussing, Canal Winchester, O.....	Best pk. red sweet ".....	2 00
A. J. Trumbo and Son, Hanging Rock.....	Best pk. white yams.....	2 00
E. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Same.....	Best display and variety sweet po- tatoes and yams 1 peck each, named and labeled.....	5 00
Arthur H. Powell, Newark, O.....	2d ".....	3 00
F. M. Whipps, Byhalia, O.....	Best 12 parsnips.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
R. R. Napier, Morral, O.....	Best 12 Danvers carrots.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
Albert Pierce, North Ridgeville, O.....	Best 12 long orange carrots.....	2 00
E. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Albert Pierce, North Ridgeville, O.....	Best 12 stump rooted carrots.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
Albert Pierce, North Ridgeville.....	Best display of carrots not less than six varieties, 6 each named and labeled.....	3 00
W. D. Whipps, Marion, O.....	2d ".....	2 00
F. M. Whipps, Byhalia, O.....	Best 12 roots salsify.....	2 00
Albert Pierce, North Ridgeville, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best 6 long blood beets for table use.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best 6 turnip beets for table use.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best 6 white sugar beets.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Albert Pierce, North Ridgeville, O.....	Best 6 red mangel wurzels.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
H. H. Knox, Pulaski, Pa.....	Best 6 Kohlrabi.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Same.....	Best 6 yellow mangel wurzels.....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00

POTATOES AND OTHER ROOT PRODUCTS—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Ed. S. Tussing, Canal Winchester, O.....	Best display and variety beets for table use and for stock, not less than three of each variety.....	\$5 00
H. H. Knox, Pulaski, Pa.....	2d best.....	3 00
Ed. S. Tussing, Canal Winchester, O.....	Best 6 rutabagas.....	2 00
H. H. Knox, Pulaski, Pa.....	2d ".....	1 00
Ed. S. Tussing, Canal Winchester, O.....	Best peck purple top turnips.....	2 00
Same.....	Best peck white top turnips.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	Best peck red Weathersfield onions.....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best peck red Globe onions.....	2 00
F. M. Whipps, Byhalia, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best peck yellow Danvers onions.....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
Same.....	Best peck yellow Globe onions.....	2 00
Albert Pierce, North Ridgeville, O.....	2d ".....	1 00
F. M. Whipps, Byhalia, O.....	Best peck white Globe onions.....	2 00
W. D. Whipps, Marion, O.....	2d ".....	1 00
Same.....	Best peck Giant Rocca onions.....	2 00
Ed. L. Tussing, Canal Winchester, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best peck potato onions.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Same.....	Best display and variety of onions, one peck each, correctly named and labeled.....	5 00
M. J. Leavitt, Mechanicsburg, O.....	2d best.....	3 00

VEGETABLES.

Owner's Name and Post-office.	Name of Article.	Amount.
Ed. S. Tussing, Canal Winchester, O.....	Best peck red tomatoes.....	\$2 00
E. G. Stockman, Prospect, O.....	2d ".....	1 00
Ed. S. Tussing, Canal Winchester, O.....	Best peck purple tomatoes.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
H. H. Knox, Pulaski, Pa.....	Best peck yellow tomatoes.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Same.....	Best display tomatoes, not less than 6 var., $\frac{1}{4}$ peck each.....	5 00
Arthur H. Powell, Newark, O.....	2d best.....	3 00
F. M. Whipps, Byhalia, O.....	Best 4 heads Drumhead cabbage.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
F. M. Whipps, Byhalia, O.....	Best 4 heads Flat Dutch cabbage.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
J. L. Keckley, Marysville, O.....	Best 4 heads red Dutch cabbage.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best 4 heads Savoy cabbage.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
W. D. Whipps, Marion, O.....	Best 4 heads cauliflower.....	2 00
F. M. Whipps, Byhalia, O.....	Heaviest head cabbage.....	2 00
Arthur H. Powell, Newark, O.....	2d ".....	1 00
Albert Pierce, North Ridgeville, O.....	Best display celery, 6 stalks in each variety.....	2 00
F. M. Whipps, Marion, O.....	2d ".....	1 00
Arthur H. Powell, Newark, O.....	Best Mango peppers.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
Arthur H. Powell, Newark, O.....	Best display peppers, var. and quality.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
D. F. Corwin, Springboro, O.....	Best 3 Marrow squashes.....	2 00
H. H. Knox, Pulaski, Pa.....	2d ".....	1 00
Same.....	Best 3 Hubbard squashes.....	2 00
R. R. Napier, Morral, O.....	2d ".....	1 00
H. H. Knox, Pulaski, Pa.....	Best 3 Essex hybrid squashes.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	Best 3 Cushaw squashes.....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00
H. H. Knox, Pulaski, Pa.....	Best 3 summer crookneck squashes.....	2 00
R. R. Napier, Morral, O.....	2d ".....	1 00
Ed. S. Tussing, Canal Winchester, O.....	Best 3 scalloped squashes.....	2 00
J. L. Keckley, Marysville, O.....	2d ".....	1 00

VEGETABLES—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Ed. S. Tussing, Canal Winchester, O.....	Best display of squashes, in variety and quality.....	\$5 00
H. H. Knox, Pulaski, Pa.....	2d	3 00
Ed. S. Tussing, Canal Winchester, O.....	Best display of pumpkins.....	3 00
R. R. Napier, Morral, O.....	Best 12 ears sweet corn, green.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
F. M. Whipps, Byhalia, O.....	Best 12 ears late sweet corn, green.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
Arthur H. Powell, Newark, O.....	Best display sweet corn, husked and on stalk, ripe and green.....	5 00
F. M. Whipps, Marion, O.....	2d	3 00
Ed. S. Tussing, Canal Winchester, O.....	Best display garden beans in pod not less than 6 var. $\frac{1}{2}$ pk. each, properly named and labeled.....	3 00
R. R. Napier, Morral, O.....	2d	2 00
Arthur H. Powell, Newark, O.....	Heaviest watermelon.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
J. L. Keckley, Marysville, O.....	Heaviest pumpkin.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
J. L. Keckley, Marysville, O.....	Heaviest squash.....	2 00
H. H. Knox, Pulaski, Pa.....	2d	1 00
Ed. S. Tussing, Canal Winchester, O.....	Best display and variety watermelons properly named, labeled.....	5 00
F. M. Whipps, Byhalia, O.....	2d	3 00
Ed. S. Tussing, Canal Winchester, O.....	Best display and variety nutmeg and muskmelons.....	5 00
Arthur H. Powell, Newark, O.....	2d	3 00
Ed. S. Tussing, Canal Winchester, O.....	Best display and variety of cucumers full grown and in pickling shape.....	2 00
F. M. Whipps, Byhalia, O.....	2d	1 00
Arthur H. Powell, Newark, O.....	Best 3 purple egg plants.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
Ed. S. Tussing, Canal Winchester, O.....	Best display and variety vegetables to include articles named in books 58 and 59 and to be made up of species other than those entered in single classes.....	20 00
Arthur H. Powell, Newark, O.....	2d	10 00

COUNTY EXHIBIT OF FARM PRODUCTS.

Owner's Name and Post-office.	Name of Article.	Amount.
J. L. Keckley, Marysville, O.....	For best representation county exhibit.....	\$75 00
D. F. Corwin, Springboro, O.....	2d	50 00
W. D. Whipps, Marion, O.....	3d	35 00

BEES AND HONEY.

Owner's Name and Post-office.	Name of Article.	Amount.
Geo. H. Kirkpatrick, Union City, Ind.....	Best display of comb honey, appearance, quality and shape for market.....	\$10 00
H. Besse, M. D., Delaware, O.....	2d	5 00
Same.....	Best case of white clover comb honey.....	2 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d	1 00
Same.....	Best case of comb honey from fall flowers.....	2 00
J. C. Boynton, Delaware, O.....	2d	1 00
Geo. H. Kirkpatrick, Union City, Ind.....	Best twelve filled sections of honey.....	2 00
H. Besse, Delaware, O.....	2d	1 00

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Owner's Name and Post-office.	Name of Article.	Amount.
H. Besse, Delaware, O.....	Best 12 lbs. extracted honey in best shape for retail dealer.....	\$2 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	1 00
J. C. Boynton, Delaware, O.....	Best display of extracted honey, quantity, quality and arrangement to govern.....	10 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	5 00
J. C. Boynton, Delaware, O.....	Best display of candied honey.....	3 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	2 00
H. Besse, Delaware, O.....	Best display of beeswax.....	3 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	2 00
M. J. Leavitt, Mechanicsburg, O.....	Best nucleus of Italian bees in observatory hive.....	3 00
Geo. H. Kirkpatrick, Union City, Ind Same	2d " "	2 00
J. C. Boynton, Delaware, O.....	Best nucleus of Carniolan bees in observatory hive.....	3 00
Geo. H. Kirkpatrick, Union City, Ind Same	Best display of comb foundation.....	3 00
H. Besse, Delaware, O.....	2d " "	2 00
Geo. H. Kirkpatrick, Union City, Ind Same	Best honey extractor.....	2 00
J. C. Boynton, Delaware, O.....	2d " "	1 00
Geo. H. Kirkpatrick, Union City, Ind Same	Best shipping can or crate for comb honey.....	2 00
J. C. Boynton, Delaware, O.....	Best hive for comb honey.....	3 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	2 00
H. Besse, Delaware, O.....	Best hive for extracted honey.....	3 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	2 00
J. C. Boynton, Delaware, O.....	Largest and best collection of apiarian supplies.....	6 00
Geo. H. Kirkpatrick, Union City, Ind.....	2d " "	3 00
H. Besse, Delaware, O.....	Largest and finest display of honey, comb and extracted.....	10 00
	2d " "	5 00

Owner's Name and Post-office.	Name of Article.	Amount.
Otis Strong, Huntsburg, O.....	Best gallon of maple syrup to be shown in glass.....	\$2 00
C. A. Kellogg, Claridon, O.....	2d " "	1 00
E. M. Wells, Claridon, O.....	Best three bricks of maple sugar.....	2 00
C. A. Kellogg, Claridon, O.....	2d " "	1 00
H. N. Ensign, Claridon, O.....	Best design in maple sugar.....	3 00
E. M. Wells, Claridon, O.....	2d " "	2 00
A. A. McNish, Burton, O.....	Best five pounds grained maple sugar.....	2 00
C. A. Kellogg, Claridon, O.....	2d " "	1 00
H. N. Ensign, Claridon, O.....	Best display of maple wax in attractive form.....	2 00
A. A. Wilmot, Claridon, O.....	2d " "	1 00
H. N. Ensign, Supt., Claridon, O.....	Largest, best and most attractive display of maple products from any one county of the state.....	10 00
H. F. Johnson, Burton, O.....	Largest, best and most attractive display of maple products by a dealer.....	Medal

Owner's Name and Post-office.	Name of Article.	Amount.
O. C. Stockman, Prospect, O.....	Best plate of Baldwin.....	\$ 2 00
E. G. Stockman, Prospect, O.....	2d " " " " " " " " " "	1 00
Frank Bookwalter, Hallsville, O.....	Best " Baltimore.....	2 00
O. E. Foster, North Amherst, O.....	2d " " " " " " " " " "	1 00
E. G. Stockman, Prospect, O.....	Best " Bailey's sweet.....	2 00
O. C. Stockman, Prospect, O.....	2d " " " " " " " " " "	1 00
J. C. Vergon, Delaware, O.....	Best " Belleflower, yellow.....	2 00
W. H. Ortman, Hallsville, O.....	2d " " " " " " " " " "	1 00
Henry Bieber, Delaware, O.....	Best plate of Belmont.....	2 00
T. Johnson, Gypsum, O.....	2d " " " " " " " " " "	1 00
G. N. Toops, Chillicothe, O.....	Best plate of Ben Davis.....	2 00
James E. Carpenter, Republic, O.....	2d " " " " " " " " " "	1 00
F. H. Miller, Adelaide, O.....	Best plate Black Gilliflower.....	2 00
E. G. Stockman, Prospect, O.....	2d " " " " " " " " " "	1 00
Same.....	Best plate Blue Pearmain.....	2 00
A. J. Trumbo & Son, Hanging Rock, O.....	2d " " " " " " " " " "	1 00

PLATE APPLES—WINTER—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
<i>5 specimens of each.</i>		
E. G. Stockman, Prospect, O.....	Best plate Cuyahoga Red Streak.....	\$2 00
O. E. Foster, North Amherst, O.....	2d	1 00
John R. Hurst, Chillicothe, O.....	Best " Dominie.....	2 00
Cobb Gavitt, Ashley, O.....	2d	1 00
W. W. Farnsworth, Waterville, O.....	Best " Golden Russet Am.....	2 00
G. N. Toops, Chillicothe, O.....	2d	1 00
E. G. Stockman, Prospect, O.....	Best " Grimes' Golden.....	2 00
O. C. Stockman, Prospect, O.....	2d	1 00
W. W. Farnsworth, Waterville, O.....	Best " Hubbardson Nonesuch.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	2d	1 00
J. C. Vergon, Delaware, O.....	Best " Jonathan.....	2 00
Henry Biepher, Delaware, O.....	2d	1 00
Frank Bookwalter, Hallsville, O.....	Best " Kaighn's Spitzenberg.....	2 00
E. G. Taggart, Lewis Center, O.....	2d	1 00
E. G. Stockman, Prospect, O.....	Best " King of Tompkins Co.....	2 00
O. E. Foster, North Amherst, O.....	2d	1 00
John R. Hurst, Chillicothe, O.....	Best " Limber Twig.....	2 00
Frank Bookwalter, Hallsville, O.....	2d	1 00
Same.....	Best " Newton Pippin.....	2 00
W. H. Ortman, Hallsville, O.....	2d	1 00
Grant Dresbach, Hallsville, O.....	Best " Northern Spy.....	2 00
T. Johnson Gypsum, O.....	2d	1 00
E. G. Stockman, Prospect, O.....	Best " Paradise, Winter Sweet.....	2 00
O. C. Stockman, Prospect, O.....	2d	1 00
John R. Hurst, Chillicothe, O.....	Best " Pennock.....	2 00
W. H. Ortman, Hallsville, O.....	2d	1 00
Frank Bookwalter, Hallsville, O.....	Best " Peck's Pleasant.....	2 00
J. C. Vergon, Delaware, O.....	2d	1 00
T. Johnson, Gypsum, O.....	Best " R. I. Greening.....	2 00
O. E. Foster, North Amherst, O.....	2d	1 00
U. T. Cox, Ensee, O.....	Best " Rome Beauty.....	2 00
J. C. Vergon, Delaware, O.....	2d	1 00
Frank Bookwalter, Hallsville, O.....	Best " Roman Stem.....	2 00
H. Bookwalter, Hallsville, O.....	2d	1 00
G. N. Toops, Chillicothe, O.....	Best " Roxbury Russet.....	2 00
Frank Bookwalter, Hallsville, O.....	2d	1 00
G. N. Toops, Chillicothe, O.....	Best " Smith's Cider.....	2 00
Frank Bookwalter, Hallsville, O.....	2d	1 00
John R. Hurst, Chillicothe, O.....	Best " Smoke House.....	2 00
Frank Bookwalter, Hallsville, O.....	2d	1 00
J. C. Vergon, Delaware, O.....	Best " Stark.....	2 00
Ed. S. Tussing, Canal Winchester, O.....	2d	1 00
E. G. Stockman, Prospect, O.....	Best " Tallman Sweet.....	2 00
M. J. Leavitt, Mechanicsburg, O.....	2d	1 00
James E. Carpenter, Republic, O.....	Best " Wagner.....	2 00
O. E. Foster, North Amherst, O.....	2d	1 00
E. G. Stockman, Prospect, O.....	Best " White Pippin.....	2 00
M. E. Hinton, Fountain, O.....	2d	1 00
Grant Dresbach, Hallsville, O.....	Best " Wine Sap.....	2 00
W. H. Ortman, Hallsville, O.....	2d	1 00
O. E. Foster, North Amherst, O.....	Best " Esopus Spitzenberg.....	2 00
T. Johnson, Gypsum, O.....	2d	1 00
F. H. Miller, Adelaide, O.....	Best " Fallwater.....	2 00
T. Johnson, Gypsum, O.....	2d	1 00
J. C. Vergon, Delaware.....	Best " Fameuse.....	2 00
E. G. Stockman, Prospect, O.....	2d	1 00
W. H. Ortman, Hallsville, O.....	Best " Rambo.....	2 00
J. C. Vergon, Delaware, O.....	2d	1 00
Frank Bookwalter, Hallsville, O.....	Best " Rawles' Janet.....	2 00
Nelson Cox, Ensee, O.....	2d	1 00
O. E. Foster, North Amherst, O.....	Best " Red Canada.....	2 00
T. Johnson, Gypsum, O.....	2d	1 00
Frank Bookwalter, Hallsville, O.....	Best " Willow Twig.....	2 00
H. Bookwalter, Hallsville, O.....	2d	1 00
Nelson Cox, Ensee, O.....	Best " York Imperial.....	2 00
U. T. Cox, Ensee, O.....	2d	1 00

PLATE APPLES—SUMMER AND FALL.

Owner's Name and Post-office.	Name of Article.	Amount.
<i>5 specimens of each.</i>		
E. G. Stockman Prospect, O.....	Best plate Alexander.....	\$2 00
O. C. Stockman, Prospect, O.....	2d " ".....	1 00
C. W. Counter, Toledo, O.....	Best " " Am. S. Pearmain.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " ".....	1 00
Same.....	Best " " Benoni.....	2 00
O. C. Stockman, Prospect, O.....	2d " ".....	1 00
J. C. Vergon, Delaware, O.....	Best " " Chenango Strawberry.....	2 00
H. H. Knox, Pulaski, Pa.....	2d best plate Chenango Strawberry.....	1 00
D. F. Corwin, Springboro, O.....	Best plate Duchess of Oldenburg.....	2 00
E. G. Stockman, Prospect, O.....	2d best plate Duchess of Oldenburg.....	1 00
Frank Bookwalter, Hallsville, O.....	Best plate Fall Pippin.....	2 00
T. Johnson, Gypsum, O.....	2d " ".....	1 00
John R. Hurst, Chillicothe, O.....	Best " " Fall Wine.....	2 00
E. G. Stockman, Prospect, O.....	Best " " Gravenstein.....	2 00
O. C. Stockman, Prospect, O.....	2d " ".....	1 00
D. F. Corwin, Springboro, O.....	Best " " Jeffries.....	2 00
E. G. Stockman, Prospect, O.....	Best " " Lowell.....	2 00
O. C. Stockman, Prospect, O.....	2d " ".....	1 00
J. C. Vergon, Delaware, O.....	Best " " Maiden's Blush.....	2 00
W. H. Ortman, Hallsville, O.....	2d " ".....	1 00
H. Bookwalter, Hallsville, O.....	Best " " Ohio Nonpareil.....	2 00
H. H. Knox, Pulaski, Pa.....	2d " ".....	1 00
O. C. Stockman, Prospect, O.....	Best " " Yellow Transparent.....	2 00
E. G. Stockman, Prospect, O.....	2d best plate Yellow Transparent.....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate Porter.....	2 00
C. W. Counter, Toledo, O.....	2d " ".....	1 00
O. E. Foster, North Amherst, O.....	Best " " Red Astrachan.....	2 00
T. Johnson, Gypsum, O.....	2d " ".....	1 00
F. H. Miller, Adelaide, O.....	Best " " Summer Strawberry.....	2 00
Henry Bieber, Delaware, O.....	2d best plate Summer Strawberry.....	1 00
T. Johnson, Gypsum, O.....	Best " " Sweet Bough.....	2 00
O. E. Foster, North Amherst, O.....	2d " ".....	1 00
E. G. Stockman, Prospect, O.....	Best " " St. Lawrence.....	2 00
O. C. Stockman, Prospect, O.....	2d " ".....	1 00
E. G. Stockman, Prospect, O.....	Best plate Wealthy.....	2 00
John R. Hurst, Chillicothe, O.....	2d " ".....	1 00
Frank Bookwalter, Hallsville, O.....	Best " " Western Beauty.....	2 00
E. G. Stockman, Prospect, O.....	2d " ".....	1 00

CRAB APPLES.

Owner's Name and Post-office.	Name of Article.	Amount.
<i>5 specimens of each.</i>		
Emmet V. Rhodes, St. Paris, O.....	Best plate Hugh's Virginia.....	\$2 00
Cobb Gavitt, Ashley, O.....	2d " ".....	1 00
Frank Bookwalter, Hallsville, O.....	Best " " Hyslop.....	2 00
H. Bookwalter, Hallsville, O.....	2d " ".....	1 00
Same.....	Best " " Red Siberian.....	2 00
Frank Bookwalter, Hallsville, O.....	2d " ".....	1 00
E. G. Stockman, Prospect, O.....	Best " " Red Kentucky.....	2 00
T. Johnson, Gypsum, O.....	Best " " Yellow Siberian.....	2 00

PLATE APPLES—CRAB APPLES.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>5 specimens of each.</i>	
C. E. Foster, North Amherst, O.....	Best plate Transcendent.....	\$2 00
Cobb Gavitt, Ashley, O.....	2d ".....	1 00
D. F. Corwin, Springboro, O.....	Best plate Whitney's No. 20.....	2 00

PEACHES.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>6 specimens to the plate.</i>	
T. Johnson, Gypsum, O.....	Best 6 varieties.....	\$4 00
W. W. Farnsworth, Waterville, O.....	2d ".....	2 00
T. Johnson, Gypsum, O.....	Best 3 varieties.....	3 00
W. W. Farnsworth, Waterville, O.....	2d ".....	2 00
J. W. Streeper, Columbus, O.....	Best new seedling or variety if approved by committee.....	3 00
C. W. Counter, Toledo, O.....	Best display not less than 10 varieties, beauty and quality to govern.....	6 00
W. W. Farnsworth, Waterville, O.....	2d ".....	4 00
	<i>6 specimens of each.</i>	
E. G. Cox, Ensee, O.....	Best plate of Beer's Smock.....	2 00
T. Johnson, Gypsum, O.....	2d ".....	1 00
Same	Best plate of Clair's Choice.....	2 00
E. G. Cox, Ensee, O.....	2d ".....	1 00
G. N. Toops, Chillicothe, O.....	Best plate Crawford Early.....	2 00
W. W. Farnsworth, Waterville, O.....	2d ".....	1 00
O. E. Foster, North Amherst, O.....	Best plate Crawford Late.....	2 00
T. Johnson, Gypsum, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate of Crosby.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate of Diamond.....	2 00
W. H. West, Chillicothe, O.....	2d ".....	1 00
C. W. Counter, Toledo, O.....	Best plate of Early River.....	2 00
G. N. Toops, Chillicothe, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate of Elberty.....	2 00
T. Johnson, Gypsum, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate of Future Great.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
T. Johnson, Gypsum, O.....	Best plate of Hill's Chili.....	2 00
W. W. Farnsworth, Waterville, O.....	Best plate Jaques Yellow Rarissime.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
O. E. Foster, North Amherst, O.....	Best plate of Lemon Cling.....	2 00
E. S. Tussing, Canal Winchester, O.....	2d ".....	1 00
T. Johnson, Gypsum, O.....	Best plate Mountain Rose.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
W. H. West, Chillicothe, O.....	Best plate of Morris White.....	2 00
P. P. Streevey, Chillicothe, O.....	2d ".....	1 00
C. W. Counter, Toledo, O.....	Best plate Marshall's Late.....	2 00
W. W. Farnsworth, Waterville, O.....	2d ".....	1 00
W. H. West, Chillicothe, O.....	Best plate Old Mixon Cling.....	2 00
G. N. Toops, Chillicothe, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate Old Mixon Free.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
W. W. Farnsworth, Waterville, O.....	Best plate of President.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
Same	Best plate of Foster.....	2 00
W. W. Farnsworth, Waterville, O.....	2d ".....	1 00
D. F. Corwin, Springboro, O.....	Best plate of George the Fourth.....	2 00
Same	Best plate Hill House Chief.....	2 00
T. Johnson, Gypsum, O.....	Best plate Red Cheeked Melocoton.....	2 00
C. W. Counter, Toledo, O.....	Best plate of Selway.....	2 00
T. Johnson, Gypsum, O.....	2d ".....	1 00
W. H. West, Chillicothe, O.....	Best plate Smock Late Free.....	2 00
P. P. Streevey, Chillicothe, O.....	2d ".....	1 00
E. G. Cox, Ensee, O.....	Best plate of Steadly.....	2 00
C. W. Counter, Toledo, O.....	2d ".....	1 00
M. E. Hinton, Fountain, O.....	Best plate Stump the World.....	2 00
T. Johnson, Gypsum, O.....	2d ".....	1 00
M. E. Hinton, Fountain, O.....	Best plate Stephen's Rarissime.....	2 00
W. W. Farnsworth, Waterville, O.....	2d ".....	1 00

PEACHES—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>5 specimens of each.</i>	
M. E. Hinton, Fountain, O.	Best plate of Ward's Late.....	\$2 00
W. W. Farnsworth, Waterville, O	2d " "	1 00
T. Johnson, Gypsum, O.	Best " Wheeler's Late.....	2 00
W. W. Farnsworth, Waterville, O.....	Best " Wheatland.....	2 00
G. N. Toops, Chillicothe, O.....	2d " "	1 00

QUINCES.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>6 specimens of each.</i>	
G. N. Toops, Chillicothe, O.....	Best plate Champion.....	\$2 00
Emmet V. Rhodes, St. Paris, O.....	2d " "	1 00
John Seibenthaler, Dayton, O.....	Best " Ray's Mammoth.....	2 00
G. N. Toops, Chillicothe, O.....	2d " "	1 00
W. W. Ortman, Hallsville, O.....	Best " Orange.....	2 00
G. N. Toops, Chillicothe, O.....	2d " "	1 00
John Seibenthaler, Dayton, O.....	Best peck of quinces.....	3 00
H. Bookwalter, Hallsville, O.....	2d " "	2 00

PLUMS.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>10 specimens of each.</i>	
W. W. Farnsworth, Waterville, O.....	Best plate Bradshaw.....	\$2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
T. Johnson, Gypsum, O.....	Best " Coe's Golden Drop.....	2 00
W. W. Farnsworth, Waterville, O.....	Best " Duane's Purple.....	2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
Same	Best " Genie.....	2 00
Isaac E. Squires, Oberlin, O.....	2d " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Garfield.....	2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
Same	Best " Imperial Gage.....	2 00
James F. Carpenter, Republic, O.....	2d " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Lombard.....	2 00
T. Johnson, Gypsum, O.....	2d " "	1 00
Isaac E. Squires, Oberlin, O.....	Best " Murdy.....	2 00
E. G. Cox, Ensec, O.....	2d " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Niagara.....	2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
T. Johnson, Gypsum, O.....	Best " Pond's Seedling.....	2 00
C. W. Counter, Toledo, O.....	Best " Reine Claude.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " "	1 00
W. H. West, Chillicothe, O.....	Best " Shropshire.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " "	1 00
Same	Best " Shippers' Pride.....	2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Wild Goose.....	2 00
C. W. Counter, Toledo, O.....	2d " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Washington.....	2 00
T. Johnson, Gypsum, O.....	2d " "	1 00
C. W. Counter, Toledo, O.....	Best " any other variety.....	2 00
T. Johnson, Gypsum, O.....	2d " "	1 00

PLUMS—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
T. Johnson, Gypsum, O.....	Best display, not less than 10 varieties	\$5 00
W. W. Farnsworth, Waterville, O.....	2d " " "	3 00
Same	Best display, not less than 5 varieties	3 00
C. W. Counter, Toledo, O.....	2d " " "	2 00

PEARS.

Owner's Name and Post-office.	Name of Article.	Amount.
T. Johnson, Gypsum, O.....	Best 6 varieties, summer and fall, 5 specimens to plate.....	\$4 00
W. W. Farnsworth, Waterville, O.....	2d " " "	3 00
C. W. Counter, Toledo, O.....	Best 10 varieties, summer, fall and winter, 5 specimens each.....	5 00
T. Johnson, Gypsum, O.....	2d " " "	3 00
C. W. Counter, Toledo, O.....	Best 3 plates of large, size and beauty to rule.....	3 00
W. W. Farnsworth, Waterville O.....	2d " " "	2 00
Grant Dresbach, Hallsville, O.....	Best variety of dessert, quality to rule.....	2 00
W. W. Farnsworth, Waterville, O.....	Best display of 20 varieties, appearance and quality to rule.....	10 00
C. W. Counter, Toledo, O.....	2d " " "	5 00
<i>5 specimens of each.</i>		
T. Johnson, Gypsum, O.....	Best plate of Bartlett.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
T. Johnson, Gypsum, O.....	Best " Belle Lucrative.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " Beurre d'Anjou.....	2 00
T. Johnson, Gypsum, O.....	2d " " "	1 00
Isaac E. Squires, Oberlin, O.....	Best " Beurre Bosc.....	2 00
W. W. Farnsworth, Waterville, O.....	Best " Beurre Clairgeau.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
E. G. Cox, Ensee, O.....	Best " Beurre Diehl.....	2 00
C. W. Counter, Toledo, O.....	Best " Clapp's Favorite.....	1 00
W. W. Farnsworth, Waterville, O.....	2d " " "	2 00
C. W. Counter, Toledo, O.....	Best " Columbia.....	1 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
Same	Best " Doyenne Boussac.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
W. W. Farnsworth, Waterville, O.....	Best " Duchesse.....	2 00
T. Johnson, Gypsum, O.....	2d " " "	1 00
Same	Best " Fie nish Beauty.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
Same	Best " Glout Morceau.....	2 00
W. W. Farnsworth, Waterville O.....	2d " " "	1 00
Isaac E. Squires, Oberlin, O.....	Best " Howell.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
E. G. Cox, Ensee, O.....	Best " Idaho.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " Kirtland.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
J. J. McMillan, Van Wert, O.....	Best " Keiffer.....	2 00
Emmet V. Rhodes, St. Paris, O.....	2d " " "	1 00
Isaac E. Squires, Oberlin, O.....	Best " Lawrence.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
D. F. Corwin, Springboro, O.....	Best " Le Comte.....	2 00
Emmet V. Rhodes, St. Paris, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " Louise Bonne.....	2 00
T. Johnson, Gypsum, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " Onondaga.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " President.....	2 00
W. W. Farnsworth, Waterville, O.....	2d " " "	1 00
Grant Dresbach, Hallsville, O.....	Best " Seckel.....	2 00
D. F. Corwin, Springboro, O.....	2d " " "	1 00
C. W. Counter, Toledo, O.....	Best " Sheldon.....	2 00
T. Johnson, Gypsum, O.....	2d " " "	1 00
Isaac E. Squires, Oberlin, O.....	Best " Vicar.....	2 00
C. W. Counter, Toledo, O.....	2d " " "	1 00
James E. Carpenter, Republic, O.....	Best " Winter Nelis.....	2 00

GRAPES—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>Not less than 4 bunches to plate.</i>	
John S. Snider, Lancaster, O.....	2d plate Wilder	\$1 00
Theo. F. Longenecker, Dayton, O.....	Best " Woodruff's red.....	2 00
E. M. Woodard, Kirtland, O.....	2d " "	1 00
E. M. Woodard, Kirtland, O.....	Best " Worden	2 00
Theo. F. Longenecker, Dayton, O.....	Best " Witt.....	2 00
J. W. Streeper, Columbus, O.....	2d " "	1 00

COUNTY FRUITS.

Owner's Name and Post-office.	Name of Article.	Amount.
	<i>100 plates of various kinds.</i>	
T. Johnson, Gypsum, O.....	Best county exhibit.....	\$70 00
W. W. Farnsworth, Waterville, O.....	2d " "	60 00
James E. Carpenter, Republic, O.....	3d " "	50 00
John R. Hurst Chillicothe, O.....	4th " "	40 00
J. C. Vergon, Delaware, O.....	5th " "	30 00

PROFESSIONAL LIST. FLOWERS AND PLANTS.

Owner's Name and Post-office.	Name of Article.	Amount.
E. L. Charles, Columbus, O.....	Best collection plants, quality and growth to be considered.....	\$20 00
George F. Brehmer, Chillicothe, O.....	2d ".....	10 00
E. L. Charles, Columbus, O.....	Best collection palms.....	10 00
George F. Brehmer, Chillicothe, O.....	2d ".....	5 00
E. L. Charles, Columbus, O.....	Best collection ferns and lycopodiums.....	10 00
George F. Brehmer, Chillicothe, O.....	2d ".....	5 00
Same.....	Best collection variegated plants.....	10 00
E. L. Charles, Columbus, O.....	2d ".....	5 00
Same.....	Best collection begonias.....	8 00
T. C. Breece, West Berlin, O.....	2d ".....	4 00
Same.....	Best collection cannas in bloom.....	10 00
E. L. Charles, Columbus, O.....	2d ".....	5 00
Same.....	Best collection draccani.....	5 00
George F. Brehmer, Chillicothe, O.....	2d ".....	3 00
Same.....	Best collection crotons.....	10 00
E. L. Charles, Columbus, O.....	2d ".....	5 00
Same.....	Best collection plants on trellis work.....	5 00
George F. Brehmer, Chillicothe, O.....	Best collection aloes and cacti.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	3 00
Same.....	Best collection carnations.....	5 00
T. C. Breece, West Berlin, O.....	Best collection geraniums in bloom.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	3 00
Same.....	2d collection petunias.....	1 00
T. C. Breece, West Berlin, O.....	Best collection roses in bloom.....	5 00
E. L. Charles, Columbus, O.....	Best collection asters.....	5 00
T. C. Breece, West Berlin, O.....	Best ribbon bed living plants.....	5 00
E. L. Charles, Columbus, O.....	Best pair vases living plants.....	5 00
Same.....	2d ".....	3 00
E. L. Charles, Columbus, O.....	Best six hanging baskets of living plants.....	5 00

CUT FLOWERS.

Owner's Name and Post-office.	Name of Article.	Amount.
C. A. Roth, Columbus, O.....	Best pair hand bouquets.....	\$5 00
E. L. Charles, Columbus, O.....	2d ".....	2 00
C. A. Roth, Columbus, O.....	Best arranged basket.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	2 00
C. A. Roth, Columbus, O.....	Best display floral designs.....	20 00
E. L. Charles, Columbus, O.....	2d ".....	10 00
C. A. Roth, Columbus, O.....	Best single floral design.....	8 00
E. L. Charles, Columbus, O.....	2d ".....	4 00
George F. Brehmer, Chillicothe, O.....	Best display of cut roses.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	2 00
George F. Brehmer, Chillicothe, O.....	2d display cut dahlias.....	2 00
E. L. Charles, Columbus, O.....	Best display of cut gladioli.....	6 00
C. A. Roth, Columbus, O.....	2d ".....	3 00
E. L. Charles, Columbus, O.....	Best display cut verbenas.....	3 00
George F. Brehmer, Chillicothe, O.....	2d ".....	2 00
Same.....	Best display cut phloxes.....	3 00
E. L. Charles, Columbus, O.....	2d ".....	2 00
George F. Brehmer, Chillicothe, O.....	Best display cut carnations.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	3 00
George F. Brehmer, Chillicothe, O.....	Best display of cut asters.....	5 00
E. L. Charles, Columbus, O.....	2d ".....	3 00
C. A. Roth, Columbus, O.....	Largest collection cut flowers shown in glasses or pots of sand, not less than six of a kind, properly labeled.....	8 00
E. L. Charles, Columbus, O.....	2d ".....	4 00

WOMAN'S WORK.

H. S. GRIMES, Member in Charge.

HOUSEHOLD FABRICS.

Owner's Name and Post-office.	Name of Article.	Amount.
Miss Anna Miller, Quincy, Ill	Best silk quilt (crazy).....	\$3 00
Mrs. B. O. Squire, Bellville, O	2d " "	3 00
Miss Anna Miller, Quincy, Ill	Best silk quilt (not crazy).....	3 00
Abner W. Graham, Reynoldsburg, O	2d " "	1 00
Anna Koerner, Alton, O.	Best velvet quilt (large).....	3 00
Miss Anna Miller, Quincy, Ill	2d " "	1 00
Mrs. P. Grooms, Brecon, O	Best worsted quilt	2 00
Miss Anna Miller, Quincy, Ill	2d " "	3 00
Abner W. Graham, Reynoldsburg, O	Best log cabin quilt	2 00
Mrs. B. C. Smith, Bellville, O	2d " "	1 00
Mrs. Thomas Poole, Reynoldsburg, O	Best white quilt.....	2 00
Mrs. P. Grooms, Brecon, O	2d " "	1 00
Mrs. J. F. Anthony, Columbus, O	Best patchwor " "	2 00
Mrs. P. Grooms, Brecon, O	2d " "	1 00
Mrs. R. Kitchen, Millville, Pa.	Best cradle quilt	1 00
Miss Anna Miller, Quincy, Ill	2d " "	50
Mrs. Mary F. Maxwell, Reynoldsburg, O	Best cotton comfort.....	2 00
Mrs. Thomas Poole, Reynoldsburg, O	2d " "	1 00
Mrs. Mary F. Maxwell, Reynoldsburg, O	Best worsted comfort	2 00
Martha M. Armstrong, Newark, O	2d " "	1 00
Mrs. M. B. Clutter, Alexandria, O	Best hearth rug (rag)	1 00
Mrs. P. Grooms, Brecon, O	2d " "	50
Miss Anna Miller, Quincy, Ill	Best hearth rug (yarn)	00
Mrs. P. Grooms, Brecon, O	2d " "	50
Same	Best rag carpet, 1 yards.....	3 00
Abner W. Graham, Reynoldsburg, O	2d " "	00
Mrs. Thomas Poole, Reynoldsburg, O	Best domestic flannel, 10 yards.....	00
Abner W. Graham, Reynoldsburg, O	2d " "	1 00
Same	Best domestic linen, 2 yards.....	2 00
Mrs. Thomas Poole, Reynoldsburg, O	2d " "	3 00
Mrs. B. O. Smith, Bellville, O	Best specimen darning	1 00
Blanche Hart, Caledonia, O	2d " "	50

KNITTING.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. Mary F. Maxwell, Reynoldsburg, O	Best pair woolen knit stockings.....	\$1 00
Mrs. P. Grooms, Brecon, O	2d " "	50
Same	Best pair woolen knit socks.....	1 00
Mrs. Mary F. Maxwell, Reynoldsburg, O	2d " "	50
Mrs. Charles Florence, Columbus, O	Best pair woolen knit baby socks.....	1 00
Mrs. E. Kitchen, Millville, Pa.	2d " "	50
Mrs. E. Buck, Lockland, O	Best pair silk knit stockings.....	1 00
Mrs. E. Kitchen, Millville, Pa.	2d " "	50
Miss Anna Miller, Quincy, Ill	Best pair silk knit socks	1 00
Mrs. W. J. Carty, Columbus, O	2d " "	50
Miss Anna Miller, Quincy, Ill	Best pair silk knit mittens.....	1 00
Mrs. E. Buck, Lockland, O	2d " "	50

MACHINE WORK—PROFESSIONAL.

Owner's Name and Post-office.	Kind of Article.	Amount.
Singer Mfg. Co., Columbus, O.....	Best and largest display, variety, and quality considered.....	\$11. Med.

MILLINERY.

Owner's Name and Post-office.	Kind of Article.	Amount.
L. P. Warman, Norwood, O.....	Best lady's hat.....	\$2 00
Miss L. Spencer, Xenia, O.....	2d ".....	1 00
Same	Best lady's bonnet.....	2 00
L. P. Warman, Norwood, O.....	2d ".....	1 00
Miss L. Spencer, Xenia, O.....	Best mourning bonnet.....	2 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	1 00
Miss L. Spencer, Xenia, O.....	2d best child's hat.....	1 00
Same	Best child's bonnet.....	2 00
Same	Best display in variety and quality.....	5 00

CHILD'S WORK.

Owner's Name and Post-office.	Kind of Article.	Amount.
Jennie Johnson, Marion, O.....	Best specimen outline embroidery.....	\$1 00
Arvilla Kitchen, Millville, Pa.....	2d ".....	50
Jennie Johnson, Marion, O.....	Best specimen cross-stitch work.....	1 00
Same	Best specimen drawn thread work.....	1 00
Arvilla Kitchen, Millville, Pa.....	Best specimen crewel work.....	1 00
Jennie Johnson, Marion, O.....	2d ".....	50
Blanche Hart, Caledonia, O.....	Best specimen paper flowers.....	1 00
Arvilla Kitchen, Millville, Pa.....	Best specimen of knitting.....	1 00
Blanche Hart, Caledonia, O.....	2d ".....	50
Miss Marie Gill, Columbus, O.....	Best specimen silk embroidery.....	1 00
L. M. Gregg, Springboro, O.....	2d ".....	50
Arvilla Kitchen, Millville, Pa.....	Best specimen of patching.....	1 00
Jennie Johnson, Marion, O.....	2d ".....	50
	2d best specimen fabric painting.....	50

LACE AND TATTLING WORK.

Owner's Name and Post-office.	Kind of Article.	Amount.
Mrs. O. P. Miller, Mt. Gilead, O.....	Best point lace handkerchief.....	\$3 00
Mrs. J. M. Coe, Mt. Gilead, O.....	2d ".....	2 00
Mrs. P. Grooms, Brecon, O.....	Best point lace collar.....	2 00
Mrs. O. P. Miller, Mt. Gilead, O.....	2d ".....	1 00
Mrs. J. M. Coe, Mt. Gilead, O.....	Best point lace infant's cap.....	2 00
Mrs. O. P. Miller, Mt. Gilead, O.....	2d ".....	1 00
Same	Best point lace specimen.....	2 00
Mrs. E. M. Tyre, Westerville, O.....	2d ".....	1 00
Mrs. J. M. Coe, Mt. Gilead, O.....	Best display of point lace.....	3 00
Mrs. O. P. Miller, Mt. Gilead, O.....	2d ".....	2 00
Miss L. Sheppard, Warrenton, Va.....	Best tatting collar.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d ".....	1 00

LACE AND TATTING WORK—Continued.

Owner's Name and Post-office.	Kind of Article.	Amount.
Miss Anna Miller, Quincy, Ill.....	Best tatting handkerchief.....	\$2 00
Miss L. Sheppard, Warrenton, Va.....	2d ".....	1 00
Same.....	Best tatting specimen.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d ".....	1 00
Same.....	Best display of tatting.....	3 00

CROCHET WORK.

Owner's Name and Post-office	Kind of Article.	Amount.
Mrs. Kate Emerick, Columbus, O.....	Best bed spread.....	\$3 00
Miss Mattie Hall, Lexington, Ky.....	2d ".....	2 00
Miss M. Johnson, Dayton, O.....	Best lace (cotton) 2 or more yards.....	2 00
Miss Mattie Hall, Lexington, Ky.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best lace (woolen).....	2 00
Miss Mattie Hall, Lexington, Ky.....	2d ".....	1 00
Mrs. J. F. Angell, Bucyrus, O.....	Best shawl (ice wool).....	2 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best infant's sacque.....	2 00
Mrs. Jos. Falkenbach, Columbus, O.....	2d ".....	1 00
Mrs. E. Buck, Lockland, O.....	Best fascinator.....	1 00
L. P. Warman, Norwood, O.....	2d ".....	50
Mrs. P. Grooms, Brecon, O.....	Best shoulder cape.....	1 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	50
Miss Anna Miller, Quincy, Ill.....	Best mittens.....	1 00
Mrs. P. Grooms, Brecon, O.....	2d ".....	50
Miss Mattie Hall, Lexington, Ky.....	Best infant's socks.....	1 00
Mrs. J. A. Jordan, Columbus, O.....	2d ".....	50
Miss L. Sheppard, Warrenton, Va.....	Best collar.....	1 00
Miss Susie E. Jordan, Columbus, O.....	2d ".....	50
Miss Anna Miller, Quincy, Ill.....	Best toilet set.....	1 00
Blanche Hart, Caledonia, O.....	2d ".....	50
Mrs. B. O. Squire, Bellville, O.....	Best table mats.....	1 00
Mrs. J. A. Jordan, Columbus, O.....	2d ".....	50
Mrs. C. J. McClure, Xenia, O.....	Best slippers.....	1 00
Mrs. C. P. Miller, Mt. Gilead, O.....	2d ".....	50
Miss L. Spencer, Xenia, O.....	Best child's hood.....	1 00
Miss Anna Miller, Quincy, Ill.....	2d ".....	50
Mrs. C. J. McClure, Xenia, O.....	Best purse.....	1 00
Miss M. Johnson, Dayton, O.....	2d ".....	50
Mrs. J. F. Angell, Bucyrus, O.....	Best skirt.....	2 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d ".....	1 00
Miss Mattie Hall, Lexington, Ky.....	Best large afghan.....	3 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d ".....	2 00
Miss Mattie Hall, Lexington, Ky.....	Best small afghan.....	2 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d ".....	1 00
Mrs. E. Breck, Lockland, O.....	Best yoke.....	1 00
Mrs. L. Trimble, Marion, O.....	2d ".....	50
Miss Mattie Hall, Lexington, Ky.....	Best display of finished pieces, not less than 10.....	5 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	2 00

OUTLINE EMBROIDERY.

Owner's Name and Post-office.	Kind of Article.	Amount.
L. P. Warman, Norwood, O.....	Best mantel lambrequin.....	\$2 00
Mrs. W. B. Sprague, Brice, O.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best pillow shams.....	2 00
Mrs. U. C. Larkin, Hillsboro, O.....	2d ".....	1 00
Miss Mattie Hall, Lexington, Ky.....	Best lunch cloth.....	2 00
Clara Jones, Delaware, O.....	2d ".....	1 00

OUTLINE EMBROIDERY—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. L. Trimble, Marion, O.....	Best lunch set.....	\$2 00
Same.....	Best tidy.....	1 00
Miss M. Johnson, Dayton, O.....	2d ".....	50
Miss Mattie Hall, Lexington, Ky.....	Best splasher.....	1 00
Mrs. R. Kitchen, Millville, Pa.....	2d ".....	50
Mrs. J. F. Angell, Bucyrus, O.....	Best pair towels.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d ".....	1 00
Miss M. Johnson, Dayton, O.....	Best table mats not less than 5.....	2 00
Mrs. J. F. Angell, Bucyrus, O.....	2d ".....	1 00
Miss M. Johnson, Dayton, O.....	Best tray cloth.....	1 00
M. M. Zwerner, Marysville, O.....	2d ".....	50
Miss M. Johnson, Dayton, O.....	Best 6 doilies.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d ".....	1 00
Miss M. Johnson, Dayton, O.....	Best specimen.....	1 00
L. P. Warman, Norwood, O.....	2d ".....	50
Miss Mattie Hall, Lexington, Ky.....	Best display, not less than 10 pieces.....	3 00
Mrs. J. F. Angell, Bucyrus, O.....	2d ".....	2 00

EMBROIDERY—COTTON AND LINEN.

Owner's Name and Post-office.	Name of Article.	Amount.
Minnie Bieber, Delaware, O.....	Best night dress.....	\$2 00
Mrs. L. Trimble, Marion, O.....	2d ".....	1 00
Mrs. W. B. Sprague, Brice, O.....	Best chemise.....	2 00
Minnie Bieber, Delaware, O.....	2d ".....	1 00
Mrs. A. B. Gill, Columbus, O.....	Best pillow shams.....	2 00
Mrs. U. C. Larkin, Hillsboro, O.....	2d ".....	1 00
Miss L. Spencer, Xenia, O.....	Best suit of underwear.....	2 00
Minnie Bieber, Delaware, O.....	2d ".....	1 00
Miss M. Johnson, Dayton, O.....	Best wall splasher.....	1 00
Mrs. P. Grooms, Brecon, O.....	2d ".....	50
Clara Jones, Delaware, O.....	Best pair towels.....	2 00
Miss Susie E. Jordon, Columbus, O.....	2d ".....	1 00
Miss Mary F. Maxwell, Reynoldsburg, O.....	Best tidy.....	1 00
Maria E. Martin, New Straitsville, O.....	Best handkerchief.....	1 00
Mrs. L. Trimble, Marion, O.....	2d ".....	50
Miss Susie E. Jordon, Columbus, O.....	Best specimen.....	2 00
Mrs. Josie M. Ingham, Marysville, O.....	2d ".....	1 00
Maria E. Martin, New Straitsville, O.....	Best sideboard cover.....	1 00

CROSS STITCH.

Owner's Name and Post-office.	Kind of Article.	Amount.
Mrs. Mary Phillips, Columbus, O.....	Best sofa pillow (made up).....	\$2 00
Mrs. L. Trimble, Marion, O.....	2d ".....	1 00
E. W. Burke, New Comerstown, O.....	Best tidy.....	1 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	50
Miss Anna Miller, Quincy, Ill.....	Best large afghan.....	3 00
Mrs. L. Trimble, Marion, O.....	2d ".....	2 00
Miss Anna Miller, Quincy, Ill.....	Best small afghan.....	2 00
Mrs. A. Cooper, Espyville, O.....	2d ".....	1 00
Same.....	Best chair cushion (made up).....	1 00
Mrs. W. B. Sprague, Brice, O.....	2d ".....	50
Mrs. L. Trimble, Marion, O.....	Best slippers.....	2 00
Mrs. C. J. McClure, Xenia, O.....	2d ".....	1 00
Mrs. L. Trimble, Marion, O.....	Best foot rest (made up).....	2 00
Mrs. B. O. Smith, Bellville, O.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best specimen.....	1 00
Mrs. W. B. Sprague, Brice, O.....	2d ".....	50
Miss Anna Miller, Quincy, Ill.....	Best display not less than 5 pieces.....	3 00
Mrs. L. Trimble, Marion, O.....	2d ".....	2 00

SILK EMBROIDERY.

Owner's Name and Post-office.	Kind of Article.	Amount.
Mrs. E. Buck, Lockland, O.....	Best lady's dress.....	\$3 00
Elizabeth Leigh, Groveport, O.....	Best lady's skirt.....	2 00
Miss Susie E. Jordan, Columbus, O.....	2d	1 00
Mary J. Merrick, Columbus, O.....	Best lady's sacque.....	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Mrs. B. O. Squire, Bellville, O.....	Best silk handkerchief with initial...	1 00
Miss L. Spencer, Xenia, O.....	2d	50
Mrs. W. B. Sprague, Brice, O.....	Best child's dress.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d	1 00
Same	Best infant's cloak.....	2 00
Mrs. P. Grooms, Brecon, O.....	2d	1 00
Same	Best infant's shawl.....	2 00
Mrs. W. B. Sprague, Xenia, O.....	2d	1 00
Miss Anna Miller, Quincy, Ill.....	Best infant's skirt.....	2 00
Mrs. P. Grooms, Brecon, O.....	2d	1 00
Miss Anna Miller, Quincy, Ill.....	Best infant's sacque.....	2 00
Mrs. J. F. Angell, Bucyrus.....	2d	1 00
Mrs. U. S. Miller, Columbus, O.....	Best specimen.....	2 00
Mrs. R. Kitchen, Millville, Pa.....	2d	1 00
Mrs. W. B. Sprague, Brice, O.....	Best display not less than 5 pieces...	5 00
Mrs. Josie M. Ingham, Marysville, O.....	2d	2 00

ROMAN EMBROIDERY.

Owner's Name and Post-office.	Kind of Article.	Amount.
Mrs. Leon Snively, West Carrollton, O.....	Best center piece.....	\$2 00
Mrs. J. F. Angell, Bucyrus, O.....	2d	1 00
E. W. Burke, New Comerstown, O.....	Best tray cloth.....	2 00
Mrs. S. H. Keller, Marion, O.....	2d	1 00
Miss Anna Miller, Quincy, Ill.....	Best lunch cloth.....	2 00
Dassie G. Cherry, Newark, O.....	2d	1 00
Mrs. Josie M. Ingham, Marysville, O.....	Best specimen.....	2 00
Mrs. A. Cooper, Espyville, O.....	2d	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best six doylies.....	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00
Mrs. E. Buck, Lockland, O.....	Best pin cushion.....	1 00
Mrs. Leon Snively, West Carrollton, O.....	2d	50
Mrs. E. Buck, Lockland, O.....	Best chair cushion.....	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best display not less than 5 pieces...	3 00
Mrs. J. F. Angell, Bucyrus O.....	2d	2 00

DRAWN THREAD WORK.

Owner's Name and Post-office.	Kind of Article.	Amount.
Miss Anna Miller, Quincy, Ill.....	Best lunch cloth.....	\$2 00
Mrs. C. S. David, Marysville, O.....	2d	1 00
Mrs. P. Grooms, Brecon, O.....	Best tray cloth.....	2 00
Miss Anna Miller, Quincy, Ill.....	2d	1 00
Mrs. Francis A. Bryant, Springfield, O.....	Best dresser scarf.....	2 00
Miss Dassie E. Cherry, Newark, O.....	2d	1 00
Mrs. E. Buck, Lockland, O.....	Best sideboard scarf.....	2 00
L. P. Warman, Norwood, O.....	2d	1 00
Miss Anna Miller, Quincy, Ill.....	Best six doylies.....	2 00
Mrs. P. Grooms, Brecon, O.....	2d	1 00
Mrs. E. W. Burke, New Comerstown, O.....	Best table cover.....	2 00
Madge Miller, Washington C. H., O.....	Best tidy.....	1 00
Miss Alice Linson, South Charleston, O.....	2d	50

DRAWN THREAD WORK—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Miss Anna Miller, Quincy, Ill.....	Best handkerchief.....	\$2 00
Mrs. J. C. Snider, Columbus, O.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best specimen.....	2 00
Mrs. P. Grooms, Brecon, O.....	2d ".....	1 00
Miss Anna Miller, Quincy, Ill.....	Best display not less than 5 pieces.....	3 00
L. P. Warman, Norwood, O.....	2d ".....	2 00

ORNAMENTAL WORK.

Owner's Name and Post-office.	Name of Article.	Amount.
Blanche Hart, Caledonia, O.....	2d best specimen wax flowers.....	\$1 00
Miss Anna Miller, Quincy, Ill.....	Best specimen bead work.....	2 00
Mrs. L. Trimble, Marion, O.....	2d ".....	1 00
Miss Felicia Hartline, Strasburg, O.....	Best specimen hair work.....	2 00
Mrs. L. Trimble, Marion, O.....	2d ".....	1 00
Mrs. Anna R. Alston, Columbus, O.....	Best specimen paper flowers.....	2 00
Mrs. M. S. Gill, Columbus, O.....	2d ".....	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best fancy calendar.....	1 00
Mrs. B. O. Squire, Bellville, O.....	2d ".....	50
Mrs. B. O. Squire, Bellville, O.....	2d best fancy jewel box.....	50
Jennie D. Snow, Columbus, O.....	Best fancy blotter.....	1 00
Mrs. Leon Snively, West Carrollton, O.....	2d ".....	50
Mrs. Anna R. Alston, Columbus, O.....	Best paper lamp shade.....	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best dressed doll.....	1 00
L. P. Warman, Norwood, O.....	2d ".....	50

OPEN TO AMATEURS ONLY.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. M. S. Gill, Columbus, O.....	Best specimen paper flowers.....	\$1 00
Miss A. B. Gill, Columbus, O.....	2d ".....	50
Mary J. Merrick, Columbus, O.....	Best paper lamp shade.....	1 00
Mrs. M. S. Gill, Columbus, O.....	Best display paper flowers.....	2 00
Mrs. W. H. Snedeker, Delaware, O.....	2d ".....	1 00
Mary J. Merrick, Columbus, O.....	Best display paper work, not flowers.....	2 00

FABRIC PAINTING.

Owner's Name and Post-office.	Name of Article.	Amount.
Miss M. Johnson, Dayton, O.....	Best painting on silk.....	\$2 00
Mrs. Frank B. Bryan, Columbus, O.....	2d ".....	1 00
Mrs. W. D. Davies, Columbus, O.....	Best painting on satin.....	2 00
Lewella Eagan, Springfield, O.....	2d ".....	1 00
Mrs. E. Buck, Lockland, O.....	Best painting on velvet.....	2 00
Mrs. Frank B. Bryan, Columbus, O.....	2d ".....	1 00

FABRIC PAINTING—Concluded.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. Josie M. Ingham, Marysville, O.....	Best painting on bolting cloth.....	\$2 00
Leuella Eagan, Springfield, O.....	2d	1 00
Mrs. J. K. Newcomer, Delaware, O.....	Best painting on wood.....	2 00
Mrs. W. D. Davies, Columbus, O.....	2d	1 00
Miss Francis A. Bryant, Springfield, O.....	Best painting on celluloid	2 00
Miss M. Johnson, Dayton, O.....	2d	1 00
Miss Frances A. Bryant, Springfield, O.....	Best painting on chamois	2 00
Mrs. L. K. Roney, Troy, O.....	2d	1 00
Miss M. Johnson, Dayton, O.....	Best tapestry painting.....	2 00
Mrs. J. K. Newcomer, Delaware, O.....	2d	1 00
Mrs. E. Buck, Lockland, O.....	Best lustre painting	2 00
Mrs. L. K. Roney, Troy, O.....	2d	1 00
Mrs. E. Buck, Lockland, O.....	Best hand painted fan	2 00
Mrs. H. O. Pond, Columbus, O.....	2d	1 00
Mrs. W. D. Davies, Columbus, O.....	Best hand painted plaque (not china)	2 00
Annie M. Hall, McConnellsville, O.....	2d	1 00
Leuella Eagan, Springfield, O.....	Best hand painted screen	3 00
Mrs. Frank B. Bryan, Columbus, O.....	2d	2 00
Leuella Eagan, Springfield, O.....	Best hand painted banner.....	2 00
Mrs. W. D. Davies, Columbus, O.....	2d	1 00
Mrs. Frank B. Bryan, Columbus, O.....	Best display, not less than 10 pieces...	5 00
Miss Francis A. Bryant, Springfield, O.....	2d	3 00

ART NEEDLE WORK—FOR AMATEURS.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. B. O. Squire, Bellville, O.....	Best mantle lambrequin	\$3 00
Mrs. Leon Snively, West Carrollton, O.....	2d	2 00
Same	Best bracket lambrequin.....	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Mrs. F. M. Williams, Norwood, O.....	Best sofa pillow (made up).....	2 00
Mrs. Leon Snively, West Carrollton, O.....	2d	1 00
Mary Falkenbach, Columbus, O.....	Best lunch cloth.....	3 00
Mrs. C. P. Lloyd, Portsmouth, O.....	2d	2 00
Dassie S. Cherry, Newark, O.....	Best tray cloth.....	2 00
Mary Falkenbach, Columbus, O.....	2d	1 00
Miss Julia Gill, Columbus, O.....	Best handkerchief case.....	2 00
Mrs. Josie M. Ingham, Marysville, O.....	2d	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best slipper case	2 00
Miss Julia Gill, Columbus, O.....	2d	1 00
Miss M. Johnson, Dayton, O.....	Best glove case.....	2 00
Mrs. B. O. Squire, Bellville, O.....	2d	1 00
Miss Julia Gill, Columbus, O.....	Best night dress case	2 00
Mrs. Leon Snively, West Carrollton, O.....	2d	1 00
Miss Julia Gill, Columbus, O.....	Best broom case	2 00
Mrs. Leon Snively, West Carrollton, O.....	2d	1 00
Miss Julia Gill, Columbus, O.....	Best photograph case	2 00
Mrs. Leon Snively, West Carrollton, O.....	2d	1 00
Same	Best pair towels.....	3 00
Mrs. B. M. McConnell, Columbus, O.....	2d	2 00
Mrs. Leon Snively, West Carrollton, O.....	Best scrap basket.....	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Mrs. B. O. Squire, Bellville, O.....	Best table scarf	2 00
Mrs. F. M. Williams, Norwood, O.....	2d	1 00
Mrs. M. Johnson, Dayton, O.....	Best dresser scarf	2 00
Mrs. Ira H. Wilson, Columbus, O.....	2d	1 00
Mary Falkenbach, Columbus, O.....	Best table center.....	2 00
Miss Mattie Hall, Lexington, Ky.....	2d	1 00
Mrs. W. S. Miller, Columbus, O.....	Best six finger bowl doilies.....	2 00
Mrs. J. F. Angell, Bucyrus, O.....	2d	1 00
Mrs. W. S. Miller, Columbus, O.....	Best six cake doilies.....	2 00
Mrs. J. F. Angell, Bucyrus, O.....	2d	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best toilet set, cushion and bottles...	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Mrs. C. S. Main, Columbus, O.....	Best picture mat and frame.....	2 00
Mrs. B. O. Squire, Bellville, O.....	2d	1 00

ART NEEDLE WORK—FOR AMATEURS—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. J. F. Angell, Bucyrus, O.....	Best tablecloth and napkins.....	
	13 pieces.....	\$4 00
Minnie Bieber, Delaware, O.....	2d	2 00
Mrs. E. Buck, Lockland, O.....	Best 3-panel fire screen.....	4 00
Same	Best table cover.....	2 00
Mrs. B. O. Squire, Bellville, O.....	2d	1 00
Mary Falkenbach, Columbus, O.....	Best book cover.....	1 00
H. L. Kauffman, Columbus, O.....	2d	50
Mrs. C. F. Lloyd, Portsmouth, O.....	Best sideboard cover.....	2 00
Mrs. M. Johnson, Dayton, O.....	2d	1 00
Mrs. B. O. Squire, Bellville, O.....	Best hand screen.....	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Same	Best lamp screen.....	2 00
Mrs. B. O. Squire, Bellville, O.....	Best head rest (made up).....	2 00
Mrs. Leon Snively, West Carrollton, O.....	2d	1 00
Elizabeth Leigh, Groveport, O.....	Best slippers (made up).....	2 00
Mrs. E. Buck, Lockland, O.....	2d	1 00
Miss Anna Miller, Quincy, Ill.....	Best shopping bag.....	2 00
Miss Julia Gill, Columbus, O.....	2d	1 00
Madge Miller, Washington C. H., O.....	Best wall splasher.....	1 00
M. M. Zwerner, Marysville, O.....	2d	50
Mrs. E. Buck, Lockland, O.....	Best laundry bag.....	2 00
Mrs. J. F. Angell, Bucyrus, O.....	2d	1 00
Madge Miller, Washington C. H., O.....	Best fancy tidy.....	2 00
Miss M. Johnson, Dayton, O.....	2d	1 00
Mary Falkenbach, Columbus, O.....	Best fancy pin cushion.....	1 00
Mrs. B. O. Squire, Bellville, O.....	2d	50
Miss L. Sheppard, Warrenton, Va.....	Best hat lining.....	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best parasol.....	2 00
Mrs. E. Buck, Lockland, O.....	Best ladies' hose.....	2 00
Mrs. P. Grooms, Brecon, O.....	2d	1 00
Mrs. Leon Snively, West Carrollton, O.....	Best ottoman (made up).....	2 00
Mary Falkenbach, Columbus, O.....	2d	1 00
Mrs. B. O. Squire, Bellville, O.....	Best gent's smoking jacket.....	3 00
Mrs. L. Spencer Xenia, O.....	2d	2 00
Mrs. Ada Gadd, Columbus, O.....	Best single specimen.....	2 00
Dassie D Cherry, Newark, O.....	2d	1 00
Mrs. B. O. Squire, Bellville, O.....	Best display art needle work, not less than 12 finished pieces.....	10 00
Mrs. Ira H. Willson, Columbus, O.....	2d	5 00

ART NEEDLE WORK—FOR PROFESSIONALS.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. A. Hyson, Columbus, O.....	Best display of not less than 8 com- plete pieces executed by exhibitor..	\$10 00
Mrs. Emma Weed, Dayton, O.....	2d	5 00
Mrs. A. Hyson, Columbus, O.....	Best single specimen executed by exhibitor.....	5 00
Mrs. Emma Weed, Dayton, O.....	2d	3 00

CHINA PAINTING—AMATEUR LIST.

Owner's Name and Post-office.	Name of Article.	Amount.
Bessie Cheseldine, Columbus, O.....	Best chocolate set.....	\$2 00
Mrs. L. K. Roney, Troy, O.....	2d	1 00
Mrs. Guy Stayman, Delaware, O.....	Best ice cream set.....	2 00
Mrs. John Joyce, Columbus, O.....	Best fish set.....	2 00

CHINA PAINTING—AMATEUR LIST—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. L. K. Roney, Troy, O.....	Best 6 cups and saucers	\$3 00
Mrs. J. F. Anthony, Columbus, O.....	2d "	2 00
Mrs. L. K. Roney, Troy, O.....	Best 6 plates	3 00
Mrs. M. E. Wiltberger, Columbus, O.....	2d "	2 00
Same	Best plaque.....	2 00
Alice M. Hipple, Delaware, O.....	2d "	1 00
Elizabeth Leigh, Groveport, O.....	Best bon bon box	2 00
Bessie Cheseldine, Columbus, O.....	2d "	1 00
Virginia A. Kiser, Columbus, O.....	Best specimen of figure.....	2 00
Mrs. L. K. Roney, Troy, O.....	2d "	1 00
Mrs. M. E. Wiltberger, Columbus, O.....	Best specime n china painting	2 00
Mrs. L. K. Roney, Troy, O.....	2d "	1 00
Mrs. Guy Stayman, Delaware, O.....	Best salad dish.....	2 00
Mrs. John J. Joyce, Columbus, O.....	2d "	1 00
Elizabeth Leigh, Groveport, O.....	Best cake plate	2 00
Alice M. Hipple, Delaware, O.....	2d "	1 00
Same	Best tray.....	2 00
Virginia A. Kiser, Columbus, O.....	Best vase.....	2 00
Clara Lawler, Columbus, O.....	2d "	1 00
Mrs. M. E. Wiltberger, Columbus, O.....	Best display china painting not less than 10 pieces.	2 00
Mrs. Guy Stayman, Delaware, O.....	2d "	1 00
Mrs. John Joyce, Columbus, O.....	Best spec Royal Worcester.....	2 00
Mrs. L. K. Roney, Troy, O.....	2d "	1 00

CHINA PAINTING—PROFESSIONAL LIST.

Owner's Name and Post-office.	Name of Article.	Amount.
Alta Morris, Columbus, O.....	Best specimen showing greatest originality and merit in design.....	\$4 00
Mrs. Laura C. Davis, Columbus, O.....	2d "	2 00
Prof. E. Aulich, Cincinnati, O.....	Best portrait.....	4 00
Alta Morris, Columbus, O.....	2d "	2 00
Same	Best figure.....	4 00
Mrs. Anna R. Alston, Columbus, O.....	2d "	2 00
Alta Morris, Columbus, O.....	Best panel.....	3 00
Helen Windle, Columbus, O.....	2d "	3 00
Mrs. Laura C. Davis, Columbus, O.....	Best plaque.....	1 00
Clara H. Ross, Columbus, O.....	2d "	3 00
Mrs. Laura C. Davis, Columbus, O.....	Best specimen conventional work.....	1 00
Helen Windle, Columbus, O.....	2d "	3 00
Alta Morris, Columbus, O.....	Best 6 cups and saucers.....	2 00
Lilly Fry Fischer, Mt. Auburn, O.....	2d "	3 00
Mrs. Laura C. Davis, Columbus, O.....	Best 6 plates.....	2 00
Miss Alice Schille, Columbus, O.....	2d "	2 00
Alta Morris, Columbus, O.....	Best specimen enamel.....	2 00
Laura Prentice, Columbus, O.....	2d "	1 00
Alta Morris, Columbus, O.....	Best specimen paste.....	2 00
Laura Prentice, Columbus, O.....	2d "	1 00
Mrs. Frank B. Bryan, Columbus, O.....	Best specimen metal.....	2 00
Helen Win. L., Columbus, O.....	2d "	1 00
Miss Florence Newcomer, Delaware, O.....	Best specimen course set	4 00
Frank B. Bryan, Columbus, O.....	2d "	2 00
Alta Morris, Columbus, O.....	Largest and finest display.....	8 00
Mrs. Laura C. Davis, Columbus, O.....	2d "	5 00

PLANTS AND FLOWERS--AMATEUR LIST.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. N. D. Perry, Columbus, O.....	2d best collection stove and green-house plants, quality and growth to be considered.....	\$5 00
Mrs. W. B. Sprague, Brice, O.....	2d best collection of not less than 10 varieties variegated leaved plants.....	4 00
Same.....	Best collection begonias, not less than 10 varieties.....	8 00
Katie Zimmer, Zimmer, O.....	2d.....	4 00
Mary E. Zimmer, Zimmer, O.....	Best collection aloes and cacti.....	5 00
Mrs. W. B. Sprague, Brice, O.....	" " geraniums in variety.....	5 00
Mrs. N. D. Perry, Columbus, O.....	2d.....	3 00
Mrs. W. B. Sprague, Brice, O.....	Best collection plants on trellises.....	3 00
Minnie Bieber, Delaware, O.....	2d.....	2 00
Mrs. W. B. Sprague, Brice, O.....	Best six hanging baskets of living plants.....	5 00
J. E. Taggart, Lewis Center, O.....	Best rustic basket, filled.....	3 00

CUT FLOWERS AND FLORAL DESIGNS.

Owner's Name and Post-office.	Name of Article.	Amount.
Sarah A. Franklin, Chillicothe, O.....	Largest and best collection of dahlias, not less than 12 named varieties.....	\$3 00
Mrs. S. O. Eggert, Massillon, O.....	2d.....	2 00
Susie E. Perry, Columbus, O.....	2d largest and best collection roses.....	2 00
Clara Bieber, Delaware, O.....	1st " " verbenas.....	3 00
Lucy W. Taggart, Lewis Center, O.....	2d " " ".....	2 00
Minnie Bieber, Delaware, O.....	Largest and best collection phloxes.....	2 00
Mrs. S. O. Eggert, Massillon, O.....	2d.....	1 00
Clara Bieber, Delaware, O.....	Best display asters.....	3 00
Susie E. Perry, Columbus, O.....	2d.....	2 00
Clara Bieber, Delaware, O.....	Best " balsams.....	2 00
Minnie Bieber, Delaware, O.....	" " geraniums.....	2 00
Mrs. S. O. Eggert, Massillon, O.....	" " petunias.....	2 00
Mrs. N. D. Perry, Columbus, O.....	2d.....	1 00
Mrs. E. G. Taggart, Lewis Center, O.....	Best display gladioli.....	2 00
Mrs. W. B. Sprague, Brice, O.....	" " coxcombs and amaranths.....	2 00
Mrs. S. O. Eggert, Massillon, O.....	2d ".....	1 00
Mrs. N. D. Perry, Columbus, O.....	2d " double zinnias.....	1 00
Mrs. N. D. Perry, Columbus, O.....	2d best and greatest display cut flowers, in variety and quality other than above.....	3 00
Mrs. S. O. Eggert, Massillon, O.....	2d best pair bouquets, any style.....	2 00
Ellis Cregg, Zimmer, O.....	" vase cut flowers.....	2 00
Same.....	" single floral design.....	3 00
Lucy W. Taggart, Lewis Center, O.....	Best collection native flowers.....	3 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d " ".....	2 00

PRESERVES, PICKLES, ETC.

Owner's Name and Post-office.	Name of Article.	Amount.
Mary C. McMillen, Union Station, O.....	Best canned tomatoes.....	\$2 00
Mrs. A. Cooper, Espyville, O.....	2d ".....	1 00
Mrs. M. B. Clutter, Alexandria, O.....	Best " blackberries.....	2 00
Mrs. L. Trimble, Marion, O.....	2d ".....	1 00
Mrs. E. G. Taggart, Lewis Center, O.....	Best " raspberries.....	2 00
Blanche Hart, Caledonia, O.....	2d ".....	1 00
Mrs. L. E. Davis, Zimmer, O.....	Best " peaches.....	2 00
Mrs. G. N. Toops, Chillicothe, O.....	2d ".....	1 00

PRESERVES, PICKLES, ETC.

Owner's Name and Postoffice.	Name of Article.	Amount.
Mrs. Henry Bieber, Delaware, O.....	Best canned pears.....	\$2 00
Mary C. McMillen, Union Station, O.....	2d	1 00
S. B. McFarland, Sunbury, O.....	Best	2 00
Mrs. M. B. Clutter, Alexandria, O.....	2d	1 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	Best	2 00
Blanche Hart, Caledonia, O.....	2d	1 00
Mrs. W. H. Snedeker, Delaware, O.....	Best	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. Henry Bieber, Delaware, O.....	Best	2 00
M. M. Zwerner, Marysville, O.....	2d	1 00
Mrs. A. Cooper, Espyville, O.....	Best	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00
Same	Best	2 00
O. C. Stockman, Prospect, O.....	2d	1 00
S. B. McFarland, Sunbury, O.....	Best	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00
Mrs. Thos. Poole, Reynoldsburg, O.....	Best	2 00
Mrs. Henry Bieber, Delaware, O.....	2d	1 00
Mrs. L. Trimble, Marion, O.....	Best	2 00
Mrs. A. Cooper, Espyville, O.....	2d	1 00
O. C. Stockman, Prospect, O.....	Best	2 00
Mrs. Henry Bieber, Delaware, O.....	2d	1 00
Mrs. M. B. Clutter, Alexandria, O.....	Best	2 00
S. B. McFarland, Sunbury, O.....	2d	1 00
Mrs. L. Trimble, Marion, O.....	Largest and best variety canned fruit.....	5 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d largest and best variety canned fruit.....	3 00
Mrs. A. Cooper, Espyville, O.....	Largest and best variety pickles.....	5 00
Mrs. L. Trimble, Marion, O.....	Largest and best variety jellies.....	3 00
Mrs. Lilly Manship, Van Wert, O.....	2d largest and best variety jellies.....	3 00
Mrs. W. H. Snedeker, Delaware, O.....	Best blackberry jelly.....	2 00
Mrs. L. E. Davis, Zimmer, O.....	2d	1 00
Mrs. Maggie McCray, Reynoldsburg, O.....	Best gooseberry	2 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	2d	1 00
L. Anna Wiseman, Columbus, O.....	Best grape	2 00
Mrs. W. H. Snedeker, Delaware, O.....	2d	1 00
Mrs. Lilly Manship, Van Wert, O.....	Best plum	2 00
L. Anna Wiseman, Columbus, O.....	2d	1 00
Mrs. Maggie McCray, Reynoldsburg, O.....	Best raspberry	2 00
Blanche Hart, Caledonia, O.....	2d	1 00
Lucy W. Taggart, Lewis Center, O.....	Best strawberry	2 00
Blanche Hart, Caledonia, O.....	2d	1 00
Miss Lilly Manship, Van Wert, O.....	Best apple	2 00
Mrs. N. D. Perry, Columbus, O.....	2d	1 00
Mrs. J. B. Taggart, Delaware, O.....	Best pear	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. Lilly Manship, Van Wert, O.....	Best crab apple	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. Henry Bieber, Delaware, O.....	Best currant	2 00
Mrs. W. H. Snedeker, Delaware, O.....	2d	1 00
Mrs. J. B. Taggart, Delaware, O.....	Best peach	2 00
Mrs. Henry Bieber, Delaware, O.....	2d	1 00
Same	Best quince	2 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d	1 00
Mrs. Maggie McCray, Reynoldsburg, O.....	Best preserved quinces	2 00
H. H. Knox, Pulaski, Pa.....	2d	1 00
Mary F. Maxwell, Reynoldsburg, O.....	Best	2 00
Mrs. E. Taggart, Lewis Center, O.....	2d	1 00
Mrs. M. B. Clutter, Alexandria, O.....	Best	2 00
Mrs. Henry Bieber, Delaware, O.....	2d	1 00
Mrs. Maggie McCray, Reynoldsburg, O.....	Best	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. A. Cooper, Espyville, O.....	Best	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. Thomas Poole, Reynoldsburg, O.....	Best	2 00
Mrs. Maggie McCray, Reynoldsburg, O.....	2d	1 00
Mrs. L. E. Davis, Zimmer, O.....	Best	2 00
Blanche Hart, Caledonia, O.....	2d	1 00
Mrs. M. B. Clutter, Alexandria, O.....	Best	2 00
Abner W. Graham, Reynoldsburg, O.....	2d	1 00
Same	Best	2 00
Mrs. Maggie McCray, Reynoldsburg, O.....	2d	1 00
Abner W. Graham, Reynoldsburg, O.....	Best	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. M. B. Clutter, Alexandria, O.....	Best	2 00
Mrs. L. E. Davis, Zimmer, O.....	2d	1 00
H. H. Knox, Pulaski, Pa.....	Best	2 00
Mrs. Henry Bieber, Delaware, O.....	2d	1 00

PRESERVES, PICKLES, ETC.—Continued.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. M. B. Clutter, Alexandria, O.....	Best preserved melons.....	\$2 00
M. M. Armstrong, Newark, O.....	2d	1 00
H. H. Knox, Pulaski, Pa.....	Best tomato catsup.....	2 00
Mrs. Harry Henderson, Upper Sandusky, O.....	2d	1 00
H. H. Knox, Pulaski, Pa.....	Best cucumber catsup	2 00
Mrs. J. B. Taggart, Delaware, O.....	2d	1 00
Eva Carpenter, Columbus, O.....	Best pickled cucumbers.....	2 00
Mrs. E. G. Taggart, Lewis Center, O.....	2d	1 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	Best " peaches.....	2 00
Mrs. W. H. Snedeker, Delaware, O.....	2d	1 00
Mrs. Henry Bieber, Delaware, O.....	Best " tomatoes.....	2 00
Mrs. M. B. Clutter, Alexandria, O.....	2d	1 00
Mrs. Henry Bieber, Delaware, O.....	Best " mangoes.....	2 00
Mrs. G. N. Toops, Chillicothe, O.....	2d	1 00
Abner W. Graham, Reynoldsburg, O.....	Best " melons.....	2 00
Mary C. McMillen, Union Station, O.....	2d	1 00
Susie E. Perry, Columbus, O.....	Best " onions.....	2 00
Mrs. M. B. Clutter, Alexandria, O.....	2d	1 00
Same	Best " gherkins.....	2 00
Mrs. Thomas Poole, Reynoldsburg, O.....	2d	1 00
Mrs. G. N. Toops, Chillicothe, O.....	Best " cabbage.....	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00
Mrs. Maggie McCray, Reynoldsburg, O.....	Best " cauliflower.....	2 00
Mrs. G. N. Toops, Chillicothe, O.....	2d	1 00
Mary C. McMillen, Union Station, O.....	Best Chili sauce.....	2 00
Eva Carpenter, Columbus, O.....	2d	1 00
Mrs. Henry Bieber, Delaware, O.....	Best chow-chow.....	2 00
Mrs. L. Trimble, Marion, O.....	2d	1 00

CEREAL, FOODS.

Owner's Name and Post-office.	Name of Article.	Amount.
Eva Carpenter, Columbus, O.....	Best one loaf domestic yeast bread....	\$2 00
M. M. Zuerner, Marysville, O.....	2d	1 00
Mrs. C. C. Lazenby, Columbus, O.....	Best one loaf domestic salt rising bread.....	2 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	2d	1 00
Mrs. L. E. Davis, Zimmer, O.....	Best domestic corn bread.....	2 00
Mrs. Maggie McCray, Reynoldsburg, O.....	2d	1 00
Miss M. Zinc, Columbus, O.....	Best " rye bread	2 00
Mary C. McMillen, Union Station, O.....	2d	1 00
Mrs. L. Trimble, Marion, O.....	Best " brown bread.....	2 00
Mrs. Maggie McCray, Reynoldsburg, O.....	2d	1 00
Same	Best " graham bread.....	2 00
Mrs. L. E. Davis, Zimmer, O.....	2d	1 00
Lucy W. Taggart, Lewis Center, O.....	Best " white loaf cake.....	2 00
Mary C. McMillen, Union Station, O.....	2d	1 00
Same	Best " fruit cake.....	2 00
Mary F. Maxwell, Reynoldsburg, O.....	2d	1 00
Same	Best " marble cake.....	2 00
Mrs. Maggie McCray, Reynoldsburg, O.....	2d	1 00
Mrs. E. P. Wright, Columbus, O.....	Best " raised biscuit.....	2 00
Mrs. Mary F. Maxwell, Reynoldsburg, O.....	2d	1 00

FINE ARTS.

H. S. GRIMES, Member in Charge.

DRAWINGS, PAINTINGS, ETC.—PROFESSIONAL.

Owner's Name and Post-office.	Name of Article.	Amount.
Lilly Fry Fischer, Mt. Auburn, O	Best life size portrait, in oil, from sittings only	\$10 00
Herman Baker, Columbus, O.....	Best original portrait in oil, of horse, bull or cow.....	10 00
Same	Best landscape from nature in oil.....	10 00
W. F. Mills, Columbus, O.....	Best specimen fruit, flower or object painting in oil, (original).....	5 00
Jessie M. Beckman, Kenton, O.....	Best figure piece in oil.....	5 00
Herman Baker, Columbus, O.....	Best exhibition of paintings, in oil, five or more pieces.	20 00
Mrs. Harriet C. Cornell, Reynoldsburg, O.....	Best life sized portrait, in water colors (free hand).....	10 00
Herman Baker, Columbus, O.....	Best landscape from nature, water colors.	10 00
Mrs. Frank B. Bryan, Columbus, O.....	Best specimen fruit, flower or object painting, in water colors (original).....	5 00
Same	Best exhibition of paintings, water colors.	15 00
Same	Best free hand crayon drawing.....	5 00
Anna M. Hall, McConnellsville. O.....	Best portrait in free hand.....	5 00

OIL PAINTING, AMATEUR.

Owner's Name and Post-office.	Name of Article.	Amount.
Vera T. Luce, Columbus, O.....	Best portrait in oil, copied from photo, not traced.	\$5 00
Mrs. Josie M. Ingham, Marysville, O.....	Best specimen oil painting from copy.....	3 00
Miss Belle Havens, Newark, O.....	Best landscape from nature, in oil.....	5 00
Vera T. Luce, Columbus, O.....	Best landscape from copy, in oil.....	3 00
Miss Alice Schille, Columbus O.....	Best figure in oil, (original).....	3 00
Harriet L. Dunn, Columbus, O.....	Best fruit, flower or object painting, in oil, (original).....	5 00
Mrs. H. O. Pond, Columbus, O.....	Best fruit, flower or object painting, in oil from copy.....	3 00
Alice M. Hipple, Delaware, O.....	Best three panel screen, in oil.....	5 00
Miss Frances A. Bryant, Springfield, O.....	Best single panel screen, in oil.....	3 00
Same	Best landscape in oil, painted on satin,	3 00
Miss Alice Schille, Columbus, O.....	Best exhibition of paintings, in oil, five or more pieces.	10 00

WATER COLORS, AMATEUR.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. W. C. Van Zant, Delaware, O.....	Best portrait in water colors, from photo..	\$5 00
Miss Jennie Cheseldine, Columbus O.....	Best figure piece in water colors from copy	3 00
Miss Clara Blesch, Columbus, O.....	Best landscape from nature, water colors.	5 00
Miss Belle Havens, Newark, O.....	Best landscape from copy, water colors....	3 00
Miss Alice Schille, Columbus, O.....	Best fruit or flower painting, water colors, from nature.	5 00
Mrs. W. C. Van Zant, Delaware, O.....	Best fruit or flower painting, water colors from copy.....	3 00
Harriet L. Dunn, Columbus, O.....	Best still life in water colors, original.....	5 00
Miss Alice Schille, Columbus, O.....	Best exhibition of paintings in water colors five or more pieces.....	10 00

DRAWING, PENCIL AND CHARCOAL.

Owner's Name and Post-office	Name of Article.	Amount.
Mrs. E. E. Wilson, Trenton, N. J.....	Best shaded charcoal drawing from object	\$3 00
Nellie L. Montgomery, Perryton, O.....	Best shaded stump drawing from copy or object.....	3 00
Harriet L. Dunn, Columbus, O.....	Best shaded brush drawing from object or nature.....	3 00
Nellie L. Montgomery, Perryton, O.....	Best free hand shaded pen drawing.....	3 00
Harriet L. Dunn, Columbus, O.....	Best sketch of landscape from nature, in pencil, charcoal, crayon or brush.....	3 00
Same.....	Best display of drawings by individual.....	5 00

PASTEL DRAWING.

Owner's Name and Post-office.	Name of Article.	Amount.
Mrs. Frank B. Bryan, Columbus, O.....	Best landscape from nature.....	\$5 00
Mrs. F. B. Bennett, Westerville, O.....	Best figure piece, original.....	5 00
Mrs. J. K. Newcomer, Delaware, O.....	Best figure piece (from copy).....	3 00
Miss Frances A. Bryant, Springfield, O.....	Best still life (original).....	3 00
D. Kahler, Columbus, O.....	Best fruit or flower drawing.....	3 00
Miss Frances A. Bryant, Springfield, O.....	Best drawing of animal or game (original)	3 00
Mrs. F. B. Bennett, Westerville, O.....	Best portrait copied from photo, and finished from sittings.....	5 00

NON-PREMIUM DEPARTMENTS.

In the departments of machinery and agricultural implements, mechanics' and manufacturers' products, music and merchandise, no premiums were offered. The exhibits were numerous, the departments being completely filled with a class of worthy articles and displays that elicited much commendable praise.

Following is a list of exhibitors:

AGRICULTURAL IMPLEMENTS, MACHINERY, ETC.

J. T. ROBINSON, Member in Charge.

Akron Cultivator Co., Akron, Ohio.....	5 Cultivators.
American Harrow Co., Detroit, Mich.....	1 disc, 2 cultivators, 2 double-row corn planters, 2 eagle claw culti- vators.
Ashland Manufacturing Co., Ashland, Ohio.....	13 iron pumps.
Barlow Planter Co., Quincy Ill.....	2 corn planters.
Bateman Manufacturing Co., Greenloch, N. J.....	1 iron age cultivator, 1 potato planter, 2 Gem garden cultivators, 2 seed drills.
Bowen Bros., Norwalk, Ohio	Fencing.
Brown Manufacturing Co., Zanesville, Ohio.....	4 wagons, 13 cultivators, 2 harrows, 1 five tooth cultivator, double and single shovel plows.
Brown-Manley Plow Co., Malta, Ohio.....	2 walking and 2 riding cultivators, steel and wood frame harrows.
Behrens, C. W., Lancaster, Ohio.....	1 dump wagon.
Bradley, C., Columbus, Ohio.....	Plows, harrows, spring-tooth harrows, garden implements.
Bucher, Gibbs & Co., Canton, Ohio.....	Farm implements.
Buchanan Fence Co., Smithville, Ohio.....	Fencing.
Budd, M. L., Trilby, Ohio.....	Scales.
Carter Wire Fence Mfg. Co., Mt. Steling, O.....	Fence Machine and Fencing.
Caswell, M. J., Sandusky, O.....	Pumps.
Columbus Electric Machine Wks, Columbus, O.....	Gas engine.
Cleveland Dryer Co., Cleveland, O.....	Fertilizers.
Collins Plow Co., Quincy, Ill.....	2 hay presses.
Common Sense Engine Co., Muncie, Ind.....	2 corn huskers, 2 corn planters
Clark Fence Co., Greenville, O.....	Fencing.
Champion Wagon Co., Owego, N. Y.....	Wagons, drills.
Challenge Wind Mill Co, Columbus, O.....	2 wind mills.
Chicago Scale Co., Chicago, Ill.....	1 stock scale.
Chase Pump Co., Columbus, O.....	40 pumps.
Coquillard Wagon Works, Newark, O.....	1 wagon.
Cyclone Woven Wire Fence Co., Holly, Mich...	Fencing and fence machine.
Clipper Plow Co., Defiance, O.....	Plows, 1 riding cultivator.
Choate Implement Co., Columbus, O.....	Wagons.
Columbus Churn Co., Columbus, O.....	Churn, washing machine.
Davis, S. C. Cleveland, O.....	Fencing.

Deere & Mansur Co., Moline, Ill.....	2 corn huskers, 2 corn planters, 3 harrows, 2 hay rakes, 1 potato planter.
De Vere Bros., Columbus, O.....	Fencing.
Dain Manufacturing Co., Carlton, Mo.....	8 corn harvesters.
Deere and Co., Moline, Ill.....	30 plows, 3 disc harrows, 2 disc cultivators, 5 riding cultivators.
Deval, Levensgood Manufacturing Co., Kansas City, Mo.....	1 hay press.
Empire Drill Co., Shortsville, N. Y.....	2 drills.
Eureka Mower Co., Utica, N. Y.....	2 mowers.
Eureka Wire Fence Co., Richmond, Ind.....	Wire fence.
Flint & Walling Manufacturing Co., Kendallville, Ind.....	6 wind mills.
Fairbank Frame Erector Co., Helena, O.....	Frame erectors.
Famous Manufacturing Co., Chicago, Ill.....	1 two horse hay press.
Foos Manufacturing Co., Springfield, O.....	Feed mills, corn shellers.
Gale Manufacturing Co., Albion, Mich.....	Full line of plows.
Geyser Manufacturing Co., Waynesboro, Pa.....	3 threshers, 3 traction engines, 1 saw mill, 1 clover huller, 1 domestic engine.
Gordon, H. Blast Grate Co., Greenville, Mich.....	Potato planters.
Gilbert & Duff Fence Co., Cleveland, O.....	Fencing.
Horn, David, Mohican, O.....	Plow.
Hartman Manufacturing Co., Vincennes, Ind.....	Cultivators.
Hayes Pump & Planter Co., Galva, Ill.....	4 corn planters.
Hindlong & Downs, Columbus, O.....	Farm machinery.
Hayworth & Son, Decatur, Ill.....	Corn planters, checkrowers, fertilizers.
Hoosier Drill Co., Richmond, Ind.....	8 drills, 1 sulky hay rake.
Homer Steel Fence Co., Homer Mich.....	Fencing.
Hench & Drungold Co., York, Pa.....	Fertilizer drills, cider mills, potato diggers, trucks.
Hullinger Fence Co., Greenville, O.....	Fencing.
Hydraulic Press Co., Mt. Gilead, O.....	Hydraulic press.
Hawley & Dunn, New Paris, O.....	American water works system.
Hultz, W. B. Norwalk O.....	3 pumps.
Halter, H., Oxford, O.....	Harrow.
Horn Steel Fence Post Co., Columbus, O.....	Fence posts.
Hoover, Prout & Co., Avery, O.....	Potato planters.
Indiana Machine Co., Ft. Wayne Ind.....	Road machine.
Jacob Barry, St. Henry, O.....	Washing machine.
J. E. Day, Bowersville, O.....	Patent truck.
J. E. Hedges, Canal Winchester, O.....	Furrowing attachment.
James Pleukharp & Co., Columbus, O.....	Trucks.
John Deere & Co., Moline Ill.....	Plows, riding and walking cultivators.
Janesville Machine Co., Janesville, Wis.....	2 disc harrows, 4 cultivators, 1 mower, 1 drill, 1 seeder.
John Dodds Manufacturing Co., Dayton, O.....	1 hay rake, 3 disc harrows.
Kemp & Burpee Manfg. Co., Syracuse, N. Y.....	Manure spreaders.
Keystone Manufacturing Co., Sterling, Ill.....	Corn planters, corn drill, hay loaders, corn shellers, corn husker and shredder.

Kitselman Bros., Ridgeville, Ind.....	Fencing.
Kopp & Co., Dayton, O.....	Cistern cleaners.
Lewis & Allen Spring Co., Jackson, Mich.....	Earth diggers.
Lucas, J. R. Outville, O.....	Hog trough.
Loomis and Nymon, Tiffin, O.....	Well drilling machinery.
Long & Alstatler Co., Hamilton, O.....	2 cultivators, rakes, plows, feed cutters.
Mast, Foos & Co., Springfield, O.....	Farm machinery.
Marion Manufacturing Co., Marion, O.....	2 engines.
Mansfield Tool Co., Mansfield, O.....	Tools.
McSherry Manufacturing Co., Middletown, O.....	Grain drills, harrows, corn planters
Moline Plow Co., Moline, Ill.....	Plows and cultivators.
Myers & Bro., Ashland, O.....	Pumps.
Milwaukee Hay Tool Co., Milwaukee, Wis.....	Corn husker and shredder.
Newark Machine Co., Newark, O.....	Clover huller and straw stacker.
Neat Fence Machine Co., Nevada, O.....	Fence machine.
Neer Bros., Mechanicsburg, O.....	Fencing.
Ohio Steel Fence Co., Piqua, O.....	Fencing.
Ohio Cultivator Co., Bellevue, O.....	Sulky cultivators, spring tooth cultivators, steel harrows.
Ohio Rake Co., Dayton, O.....	Hay loader, hay tedder, 2 hay rakes, 4 harrows, 1 corn sheller, 1 barn swing.
Ohio Rotary Plow and Manufacturing Co., Westerville, O.....	2 rotary disc plows.
Oliver Chilled Plow Works, South Bend, Ind.....	Plows and other farm implements.
O. K. Sulky Plow Co., Hamilton, O.....	Patent plows.
Perfect Washing Machine Co., Columbus, O.....	Washing machines.
Page Woven Wire Fence Co., Adrian, Mich.....	Fence and fine display of wild animals in enclosures.
P. P. Mast & Co., Springfield, O.....	Grain drills, potato planter, cider mills, cultivators, hay rake, lawn mowers.
Polar Creamery Co., LaFayette, Ind.....	Creamers.
Princess Plow Co., Canton, O.....	Plows and cultivators.
Parrish & Weakly, Middleport, O.....	Patent gate.
Pascall, F. M., Ashley, O.....	Fence machinery.
Peterson Manufacturing Co., Kent, O.....	2 pulverizers.
J. A. Palm, Lexington, O.....	Plow
Racine Wagon & Carriage Co., Racine, Wis.....	Buggies and road wagons.
Roderick Lean Manufacturing Co., Mansfield, O.....	4 steel lever harrows, 3 diamond frame harrows, 1 globe disc harrow.
Ross Cutter Co., Springfield, O.....	Corn huskers.
Rock Plaster Manufacturing Co., Columbus, O.....	Patent plaster.
Ruhl, C. E. Findlay, O.....	2 dish washers.
Shuart Land Grader Co., Oberlin, O.....	Land grader.
South Bend Chilled Plow Co., South Bend, Ind.....	Steel plows, chilled plows, sulky plows, cultivators, shovel plows.
Sheidler Machine Co., Newark, O.....	Engine.
Starr, O. C., Delaware, O.....	Rock crusher, road grader.
Stoddard Manufacturing Co., Dayton, O.....	Corn planters, disc harrows, hay tools, lawn swings.
Star Manufacturing Co., New Lexington, O.....	Feed mills.

Speakman Fence Co., New Castle, Ind.....	Fencing.
Springfield Fertilizer Co., Springfield, O.....	Fertilizers.
Spellacy & Kavffman, Columbus, O.....	Self-dumping wagon.
Syracuse Chilled Plow Co., Syracuse, N. Y.....	Plows, cultivators, spring-tooth harrows.
Selby Starr Co., Peoria, Ill.....	Grain weighers.
Superior Drill Co., Springfield, O.....	Fertilizer drills, plain drills, cultivators, hay tools.
E. H. Shumaker, Columbus, O.....	Paints.
Standard Corn Husker Co., Greenspring, O.....	Corn huskers.
Scank & Owen, Delaware, O.....	Fencing.
Smith & Pomeroy, Kalamazoo, Mich.....	3 wind mills.
Safety Corn Husker Co., Indianapolis, Ind.....	Shredder and husker.
St. Albans Foundry Co., St. Albans, Vt.....	2 corn fodder shredders.
Stephens & Son, Auburn, N. Y.....	Corn huskers.
Thomas Manufacturing Co., Springfield, O.....	Hay tools, lawn mowers, pumps, harrows.
Troy Wagon Works, Troy, O.....	One-horse farm wagon, 3 two-horse farm wagons, 1 pivot axle wagon.
The Phillis Fence Co., Springfield, O.....	Fencing.
The H. L. Burnett Co., Westerville, O.....	Ditching machinery.
The J. C. Woodcock Co., Chillicothe, O.....	Feed mills.
Taylor & Downs Co., Columbus, O.....	Full line of farm implements.
The Riggle Bros., Westerville, O.....	Farm implements.
The Perkins Wind Mill Co., Milwaukee, Wis.....	3 wind mills.
The Rock Island Plow Co., Rock Island, Ill.....	Plows and cultivators.
The Michigan Salt Association, Columbus, O.....	Salt.
The Norwalk Lockstay Fence Co., Columbus, O.....	Fencing.
The A. C. Evans Manufacturing Co., Springfield, O.....	Farm implements.
The Rickford & Huffman Co., Indianapolis, Ind.....	Farm implements.
The Combination Fence Co., Derby, O.....	Fencing.
The Boggs Fence Stay Co., Covington, O.....	Fencing.
The Brick and Medal Fence Co., Lancaster, O.....	Fencing.
The Albright Bros., Greenville, O.....	Fencing.
The H. P. Dusher Co., Hamilton, O.....	Farm implements.
The DeLaval Separator Co., Worthington, O.....	2 cream separators.
The C. M. Fence Stay Co., Covington, O.....	Fencing.
The Jones Fence Co., Columbus, O.....	Fencing.
The Frost Wire Fence Co., Columbus, O.....	Fencing.
T. J. Grubbs, Arcanum, O.....	Handy harness.
The J. I. Case Co., Racine, Wis.....	Farm implements.
The Buckeye Food Boiler Co., Tiffin, O.....	Food boiler.
The Runkle, Wiler & Barth Mfg. Co., Milwaukee, Wis.....	Lifting jack.
The Baer Double Lock Fence Co., Hagerstown, Md.....	Fencing.
The Walter A. Wood Co., Hoosick Falls, N. Y.....	Harvesting machine.
The Bowen Fence Co., Norwalk, O.....	Fencing.
Thomas Gerley, Lilly Chapel, O.....	Kitchen cabinets.
The Cutaway Harrow Co., Columbus, O.....	Plows, disc harrows, seeder.
The Avery Plow Co., Louisville, Ky.....	Rolling plow coulter.

Victor Washer Co., Utica, N. Y.....	Washing machines.
Vermont Farm Machine Co., Bellows Falls, Vt.....	Dairy machinery.
W. B. McCloud, Columbus, O.....	Tree wagon.
Wayne Agricultural Works, Richmond, Ind.....	Drills, corn planters, cutting boxes, wagons, buggies and carts.
Wiard Plow Co., Batavia, N. Y.....	Harrows, plows, rakes, weeders.
Western Union Chemical Co., Cleveland, O.....	Fertilizers.
Western Wheel Scraper Co., Aurora, Ill.....	2 road scrapers.
Wolf, C. K., Xenia, O.....	Fencing.
Wilburn & Blaney, Surprise, O.....	Bagger and weigher.
Warren Evaporator Works, Warren, O.....	Evaporator.
Wert, W. W., Ithaca, O.....	Gates.
William Mason, Groveport, O.....	Drain tile.
Weber Wagon Co., Chicago, Ill.....	Farm wagons.
Wright, J. F., Columbus, O.....	Cream separator.

MERCHANTS' AND MANUFACTURERS' PRODUCTS.

A. H. KLING, Member in Charge.

C. F. Allen, Columbus, O.....	Natural gas appliances for cooking and heating stoves.
Buckeye Buggy Co., Columbus, O.....	Victorias, coaches, surreys, traps and tally-ho.
A. L. Baker, Columbus, O.....	Bicycles, etc.
Byrne & Millar, Columbus, O.....	Lever, motor, carrier, carriages.
Bradley, Munk & Co., Columbus, O.....	Stoves and household furnishings.
S. P. Callahan, Columbus, O.....	Kitchen cabinet.
Columbus Vehicle Co., Columbus, O.....	Traps, buggies, etc.
Columbus Bicycle Co., Columbus, O.....	Bicycles, etc.
Columbus Brass Co., Columbus, O.....	Bath rooms and toilet supplies.
Cherrington & Co., Columbus, O.....	Rubber stamps, stencils and badges.
E. C. Eames, Agent, Marysville, O.....	Buggies, low down delivery wagons.
For Shipman, Bradt & Co., De Kalb, Ill.....	
W. B. George, Columbus, O.....	Patent street-car fender and dish- washer.
M. Hertenstine, Columbus, O.....	Heating and cooking stoves.
Immel & Son, Columbus, O.....	Heavy and light express and delivery wagons, surreys, phaetons and bug- gies.
W. A. Jones, representing W. W. Frantz, Rohr- erstown, Pa.....	New idea seat, for buggies and cutters.
W. C. Miller, Columbus, O.....	Crystal washing machine.
The National Wagon Co., Marion, O.....	Fancy delivery wagons and cart.
James Ohlen & Sons, Columbus, O.....	Cross and circular saws.
W. D. Patterson, Flint, Mich.....	Buggies and phaetons.
W. O. Allen, Fostoria, O., representing the Pea- body Buggy Co.....	Buggies, etc.
F. C. Powell, Columbus, O.....	The Crawford Wheel and Gear Co.
J. C. Sherwood, Columbus, O.....	Athletic goods and bicycles.
Schoedinger, Fearn & Co., Columbus, O.....	Heating and cooking stoves.
J. H. & F. A. Sells, Columbus, O.....	Harness, saddles, robes, whips, etc.
W. F. Savage, Columbus, O.....	Bicycles and furnishings.
U. S. Carriage Co., Columbus, O.....	Fancy hearses, funeral car and coaches.
H. J. Wilby, Columbus, O.....	Jewelry, etc.

- J. E. Wenger, Burton City, O.....Bath cabinet.
 C. A. White, representing The A. Howard Co.,
 Galion, O.....Buggies, phaetons, etc.
 U. S. Ice Cream Freezer Co., Dayton, O.....Patent ice cream freezer.

MERCHANDISE, MUSIC, ETC.—A. H. KLING, Member in charge.

- Howald & Co., Columbus, O.....Furniture, carpets and curtains.
 Union Clothing Co., Columbus, OClothing and gents furnishings.
 Star Stoneware Co., Crooksville, O.....Stoneware of all kinds.
 Sprague Umbrella Co., Norwalk, O .. Umbrellas.
 Columbus Bar Fixture Co., Columbus, O.....Bar room fixtures of all kinds
 McAllister, Mohler & Co., Columbus, O.....Furniture.
 C. H. D. Robbins, Columbus, O.....Dry goods.
 Hockett Bros., Columbus, O.....Pianos and organs.
 Capewell Horse Shoe Nail Co., Hartford, Conn.,
 exhibit made by Detroit, Mich., Branch.....Horse shoes and horse shoe nails.
 F. A. Stallman, Columbus, OTrunks, valises, etc.
 Elliott Bakery Co., Columbus, O.....Bread, cakes and crackers.
 George Babb & Son, Columbus, O....."Wondor" flour.
 Columbus Tailoring Co., Columbus, O.....Suits made to order.
 D. J. Burtnett, Agt., Columbus, OChampion Saratoga Chip Co., Spring-
 field, O.
 G. W. Bethel, Columbus, O.....Pictures and memorials.
 F. H. Darby, Supt., Columbus, O.....Children's Home Society.
 Buckeye Paste Co., Columbus, O.....Paste cement.
 Pleukharp Table Co., Columbus, OTables.
 N. E. Lovejoy, Columbus, OViolin exhibit.
 F. R. Cross & Co., Columbus, Ojewelry.

ABSTRACTS FROM REPORTS OF COUNTY AGRICULTURAL SOCIETIES FOR 1895.

TABLE I.—COUNTY FAIRS IN OHIO FOR 1896.

County.	President.	Postoffice.	Treasurer.	Postoffice.
Adams.....	W. K. Coleman.....	West Union.....	Henry Scott.....	West Union
Allen.....	Henry C. Adgate.....	Lima.....	A. D. Miller.....	Lima
Ashtabula.....	G. S. Harvey.....	Rock Creek.....	L. M. Cornwell.....	Jefferson
Athens.....	S. F. Wolfe.....	Athens.....	W. F. Scott.....	Athens
Auglaize.....	J. T. Van Horn.....	New Hampshire.....	Frank Rigden.....	Wapakoneta
Belmont.....	Not reported.....	Georgetown.....	Ben. B. Whiteman.....	Georgetown
Brown.....	V. R. Thompson.....	La Soudersville.....	T. J. Straub.....	Hamilton
Butler.....	S. K. Hughes.....	Harlem Springs.....	T. J. Saltsman.....	Carrollton
Carroll.....	James A. Lee.....	Urbana.....	H. P. Wilson.....	Urbana
Champaign.....	C. H. Ganson.....	Lawrenceville.....	J. H. Garlough.....	Pitchin
Clark.....	E. W. Handers.....	Felicity.....	J. O. Rapp.....	Owensville
Clermont.....	E. D. Pather.....	Wellsville.....	J. N. Brown.....	Gavers
Columbiana.....	J. F. McQueen.....	Coshocton.....	Joseph D. Rue.....	Coshocton
Coshocton.....	W. S. Miller.....	Bucyrus.....	M. J. Monnett.....	Bucyrus
Crawford.....	E. B. Monnett.....	South Cleveland.....	H. U. Bigalow.....	Chagrin Falls
Cuyahoga.....	L. R. Dunham.....	Parma.....	W. J. Poots.....	Strongsville
West Cuyahoga.....	R. A. James.....	Delisle.....	F. M. Eldson.....	Greenville
Darke.....	J. M. Brown.....	Lewis Center.....	Fred T. Jones.....	Delaware
Defiance.....	Not reported.....	Prout.....	C. B. Wilcox.....	Sandusky
Delaware.....	Andrew J. Harter.....	Amanda.....	A. I. Vorys.....	Lancaster
Erie.....	S. C. Prout.....	Washington C. H.....	H. D. Purcell.....	Washington C. H.
Fairfield.....	T. J. Barr.....	Fayette.....	J. W. Howard.....	Winameg
Fayette.....	L. C. Malow.....	Burton Station.....	H. C. Tuttle.....	Burton
Fulton.....	L. G. Ely.....	Xenia.....	T. L. Magruder.....	Xenia
Geauga.....	P. W. Merriman.....	Washington.....	R. S. Frame.....	Washington
Greene.....	J. W. Pollock.....	Carthage.....	Wm. H. Blair.....	Madisonville
Guernsey.....	Maj. J. W. Moore.....	Mt. Blanchard.....	I. G. Hull.....	Ft. Laid
Hamilton.....	B. P. Cutchell.....			
Hancock.....	M. C. Greer.....			

Hardin.....	J. M. Fisher.....	Kenton.....	F. H. Rummel.....	Kenton.....
Harrison.....	A. D. McGuire.....	Cadiz.....	W. S. Cessna.....	Cadiz.....
Henry.....	H. C. Groschner.....	Napoleon.....	R. B. Heller.....	Napoleon.....
Highland.....	S. P. Scott.....	Hillsboro.....	William H. Haley.....	Hillsboro.....
Hocking.....	Not reported.....	Millersburg.....	C. D. Parkinson.....	Millersburg.....
Holmes.....	W. G. Rudy.....	Norwalk.....	William Perrin.....	Norwalk.....
Huron.....	T. C. Laylin.....	Smithfield.....	Chas. McKinney.....	Smithfield.....
Jefferson.....	A. L. Southerland.....	.....	.....	.....
Knox.....	Not reported.....	.....	.....	.....
Lake.....	Not reported.....	Bradrick.....	C. J. Reynolds.....	Proctorville.....
Lawrence.....	M. L. Whitley.....	Perryton.....	A. J. Crilly.....	Newark.....
Licking.....	C. W. Martin.....	De Graff.....	S. E. Almon.....	Bellefontaine.....
Logan.....	Luther H. Pool.....	East Toledo.....	J. C. Messer.....	East Toledo.....
Lucas.....	Thomas Crofts.....	North Ridgeville.....	J. E. Willard.....	Elyria.....
Lorain.....	J. L. Reed.....	Somerford.....	M. L. Rea.....	London.....
Madison.....	Chas. A. Wilson.....	Tiger.....	H. A. Manchester.....	Canfield.....
Mahoning.....	B. P. Baldwin.....	Marion.....	S. N. Titus.....	Marion.....
Marion.....	Albert Osborn.....	Medina.....	A. T. Spitzer.....	Medina.....
Medina.....	F. A. Branch.....	Pomeroy.....	John McQuigg.....	Pomeroy.....
Meigs.....	P. B. Stanbery.....	Early.....	J. M. Winters.....	Celina.....
Mercer.....	S. H. Weaver.....	.....	.....	.....
Miami.....	T. S. Scott.....	Troy.....	John A. McCurdy.....	Troy.....
Monroe.....	W. C. Mooney.....	Woodsfield.....	W. C. Mooney.....	Woodsfield.....
Morgan.....	John G. Walker.....	McConnellsville.....	J. W. McElhiney.....	McConnellsville.....
Morrow.....	W. O. Thuma.....	Shauk.....	J. M. Moody.....	Mt. Gilead.....
Muskingum.....	S. A. Baldwin.....	Zanesville.....	Jas. E. Tanner.....	Zanesville.....
Noble.....	W. S. Spriggs.....	Sarahsville.....	C. L. Hillyer.....	Sarahsville.....
Ottawa.....	G. W. Sloan.....	Port Clinton.....	L. W. Camper.....	Port Clinton.....
Paulding.....	J. L. Slager.....	Paulding.....	Floyd Atwill.....	Paulding.....
Perry.....	A. E. Wilson.....	Rehoboth.....	E. S. Martin.....	New Straitsville.....
Portage.....	C. C. Gardner.....	Freedom.....	Chas. H. Lambert.....	Ravenna.....
Preble.....	J. E. Anderson.....	Camden.....	C. F. Brooke, Jr.....	Eaton.....
Putnam.....	Berry Seitz.....	Columbus Grove.....	C. H. Rice.....	Ottawa.....
Richland.....	Jerry Needham.....	Lexington.....	M. D. Ward.....	Mansfield.....
Ross.....	Clark W. Story.....	Chillicothe.....	Theo. Spetnagel.....	Chillicothe.....
Sandusky.....	S. B. Cole.....	Fremont.....	T. A. Lang.....	Fremont.....
Scioto.....	Theo. Doty.....	Portsmouth.....	Floyd L. Smith.....	Portsmouth.....
Shelby.....	Isaac Betts.....	Sidney.....	A. L. Marshall.....	Sidney.....
Stark.....	S. A. Conrad.....	Massillon.....	H. A. Wise.....	Canton.....

TABLE I.—COUNTY FAIRS IN OHIO FOR 1896—Continued.

County.	President.	Postoffice.	Treasurer.	Postoffice.
Summit	L. S. Ebricht.....	Akron	G. W. Brewster.....	Akron
Trumbull	S. F. Bartlett.....	Warren	O. D. Morgan.....	Warren
Tuscarawas	S. Humerickhouse.....	New Philadelphia.....	V. Wentz.....	Canal Dover
Union.....	O. E. Lincoln.....	Milford Center	J. J. Watts.....	Broadway
Van Wert.....	J. S. Stuckey.....	Van Wert.....	E. B. Gilliland.....	Van Wert
Vinton	Not reported.....	Lebanon	F. M. Cunningham	Lebanon
Warren	Huse Bone.....	Lebanon	J. H. McConnell.....	Marietta
Washington	F. G. Best.....	Marietta	W. A. Wilson	Wooster
Wayne	A. Cunningham.....	Wooster	E. B. Beverstock.....	Tontogany
Wood	Frank Powell.....	Perrysburg.....	Henry Kear.....	Upper Sandusky
Wyandot	S. B. Gillett.....	Carey.....		

COUNTY FAIRS IN OHIO FOR 1896 WITH TIME AND PLACE—Continued.

County.	Secretary.	Postoffice.	Time of Fair.	Place of Fair.
Adams.....	T. W. Ellison.....	West Union.....	Sept. 8, 9, 10 and 11.....	West Union
Allen	Miner A. Atmur.....	Lima.....	Sept. 8, 9, 10 and 11.....	Lima
Ashtabula	B. F. Perry, Jr.....	Jefferson	Sept. 22, 23, 24 and 25.....	Jefferson
Athens	C. S. McDougall.....	Athens	Aug. 25, 26, 27 and 28.....	Athens
Anglaize.....	M. J. Crawford.....	Wapakoneta.....	Sept. 22, 23, 24 and 25.....	Wapakoneta
Belmont.....	Not reported.....			
Brown	J. W. Hedrick.....	Russellville	Oct. 6, 7, 8 and 9.....	Georgetown

Butler.....	W. C. Hunter.....	Hamilton.....	Oct. 5, 6, 7, 8 and 9.....	Hamilton.....
Carroll.....	C. A. Tope.....	Carrollton.....	Sept. 29, 30 and Oct. 1 and 2.....	Carrollton.....
Champaign.....	J. W. Crowl.....	Urbana.....	Aug. 18, 19, 20 and 21.....	Urbana.....
Clark.....	Wm. Jenkins.....	Seth.....	Aug. 25, 26, 27 and 28.....	Springfield.....
Clermont.....	John Rowan.....	Blowville.....	Sept. 8, 9, 10 and 11.....	Owensville.....
Columbiana.....	E. F. Moore.....	Lisbon.....	Sept. 15, 16 and 17.....	Lisbon.....
Coshocton.....	Robert Boyd.....	Coshocton.....	Oct. 6, 7, 8 and 9.....	Coshocton.....
Crawford.....	B. Beal.....	Bucyrus.....	Sept. 22, 23, 24 and 25.....	Bucyrus.....
Cuyahoga.....	Tryon Bailey.....	Chagrin Falls.....	Sept. 22, 23, 24 and 25.....	Chagrin Falls.....
West Cuyahoga.....	C. H. Busby.....	Berea.....	Sept. 15, 16, 17 and 18.....	Berea.....
Darke.....	John P. Lucas.....	Greenville.....	Aug. 24, 25, 26, 27 and 28.....	Greenville.....
Defiance.....	Not reported.....	.....	.....	.....
Delaware.....	E. A. Furniss.....	Delaware.....	Sept. 15, 16, 17 and 18.....	Delaware.....
Erie.....	John T. Mack.....	Sandusky.....	Sept. 22, 23, 24 and 25.....	Sandusky.....
Fairfield.....	W. T. McClenaghan.....	Lancaster.....	Oct. 13, 14, 15, 16 and 17.....	Lancaster.....
Fayette.....	N. B. Hall.....	Washington C. H.....	Aug. 11, 12, 13 and 14.....	Washington C. H.....
Fulton.....	Thos. Mikesell.....	Wauseon.....	Sept. 22, 23, 24 and 25.....	Wauseon.....
Geauga.....	P. W. Parmelee.....	Burton.....	Sept. 15, 16, 17 and 18.....	Burton.....
Greene.....	R. R. Grieve.....	Xenia.....	Aug. 11, 12, 13 and 14.....	Xenia.....
Guernsey.....	V. D. Craig.....	Washington.....	Sept. 29 and 30, and Oct. 1 and 2.....	Washington.....
Hamilton.....	D. L. Sampson.....	222 E. Third St., Cin.....	Aug. 18, 19, 20 and 21.....	Carthage.....
Hancock.....	J. J. Cole.....	Findlay.....	Sept. 23, 24, 25 and 26.....	Findlay.....
Hardin.....	A. M. Rice.....	Kenton.....	Oct. 6, 7, 8 and 9.....	Kenton.....
Harrison.....	J. C. Glover.....	Cadiz.....	Sept. 30 and Oct. 1 and 2.....	Cadiz.....
Henry.....	J. L. Halter.....	Napoleon.....	Sept. 15, 16, 17 and 18.....	Napoleon.....
Highland.....	H. L. Wiggins.....	Hillsboro.....	July 21, 22, 23 and 24.....	Hillsboro.....
Hocking.....	Not reported.....	.....	.....	.....
Holmes.....	G. F. Gilbert.....	Millersburg.....	Sept. 29, 30, Oct. 1 and 2.....	Millersburg.....
Huron.....	A. Sheldon.....	Norwalk.....	Sept. 8, 9, 10 and 11.....	Norwalk.....
Jefferson.....	J. O. Hayne.....	Smithfield.....	Sept. 23, 24 and 25.....	Smithfield.....
Knox.....	Not reported.....	.....	.....	.....
Lake.....	Not reported.....	.....	.....	.....
Lawrence.....	W. W. Reckard.....	Proctorville.....	Sept. 9, 10 and 11.....	Proctorville.....
Licking.....	Ad. C. Seymour.....	Newark.....	Aug. 25, 26, 27 and 28.....	Newark.....
Logan.....	Banner M. Allen.....	Bellefontaine.....	Sept. 29 and 30 and Oct. 1 and 2.....	Bellefontaine.....
Lorain.....	J. E. Willard.....	Elyria.....	Sept. 29 and 30 and Oct. 1 and 2.....	Elyria.....
Lucas.....	C. R. Bowen.....	Toledo.....	Sept. 22, 23, 24, 25 and 26.....	Toledo.....
Madison.....	E. B. Pancake.....	London.....	Sept. 8, 9, 10 and 11.....	London.....
Mahoning.....	J. H. Ruhlman.....	Youngstown.....	Sept. 29 and 30 and Oct. 1.....	Canfield.....
Marion.....	J. E. Waddell.....	Marion.....	Sept. 29 and 30 and Oct. 1 and 2.....	Marion.....

COUNTY FAIRS IN OHIO FOR 1896 WITH TIME AND PLACE—Continued.

County.	Secretary.	Postoffice.	Time of Fair.	Place of Fair.
Medina	Hiram Goodwin.....	Medina	Sept. 8, 9 and 10.....	Medina
Meigs	H. C. Fish.....	Pomeroy	Sept. 2, 3 and 4.....	Rock Spring
Mercer	C. W. Halfhill.....	Mercer	Aug. 18, 19, 20 and 21.....	Celina
Miami	W. I. Tenny.....	Troy	Sept. 28, 29 and 30 and Oct. 1 and 2.....	Troy
Monroe	George P. Dorr.....	Woodsfield	Sept. 1, 2 and 3.....	Woodsfield
Morgan	M. E. Danford.....	McConnellsville.....	Sept. 1, 2, 3 and 4.....	McConnellsville
Morrow	O. J. Miller.....	Mt. Gilead	Oct. 6, 7, 8 and 9.....	Mt. Gilead
Muskingum	J. D. Mercer.....	Zanesville	Sept. 8, 9, 10 and 11.....	Zanesville
Noble	Arthur McWilliams.....	Sarahsville	Sept. 16, 17, and 18.....	Sarahsville
Ottawa	J. J. Ineichen.....	Port Clinton	Sept. 16, 17, and 18.....	Port Clinton
Paulding	F. M. Bashore.....	Paulding.....	Sept. 15, 16, 17 and 18.....	Paulding
Perry	James E. Curran.....	New Lexington.....	Sept. 15, 16, 17 and 18.....	New Lexington
Portage	Lafayette Smith.....	Ravenna	Sept. 15, 16 and 17.....	Ravenna
Preble	Henry H. Farr.....	Eaton	Sept. 21, 22, 23, 24 and 25.....	Eaton
Putnam	A. P. Sandles.....	Ottawa.....	Oct. 6, 7, 8, 9 and 10.....	Ottawa
Richland	Newton Charles.....	Mansfield	Oct. 13, 14, 15 and 16.....	Mansfield
Ross	Henry W. Woodrow	Chillicothe	Aug. 4, 5, 6 and 7.....	Chillicothe
Sandusky	Jas. A. Smith.....	Fremont.....	Sept. 29 and 30 and Oct. 1 and 2.....	Fremont
Scioto.....	Edgar F. Draper.....	Portsmouth	July 28, 29, 30 and 31.....	Portsmouth
Shelby	J. E. Russell.....	Sidney	Sept. 22, 23, 24 and 25.....	Sidney
Stark	A. B. Correll.....	Canton.....	Sept. 22, 23, 24 and 25.....	Canton
Summit	Albert Hale.....	Mogadore	Sept. 29 and 30 and Oct. 1 and 2.....	Akron
Trumbull	Jas. L. Kennedy.....	Warren	Sept. 8, 9, 10 and 11.....	Warren
Tuscarawas	H. W. Streb.....	Canal Dover.....	Sept. 29 and 30 and Oct. 1 and 2.....	Canal Dover
Union.....	E. W. Porter.....	Marysville.....	Sept. 22, 23, 24 and 25.....	Marysville
Van Wert.....	O. D. Swartout	Van Wert.....	Sept. 8, 9, 10 and 11.....	Van Wert
Vinton.....	Not reported.....	Lebanon	Sept. 15, 16, 17 and 18.....	Lebanon
Warren	George W. Carey	Marietta	Sept. 2, 3 and 4.....	Marietta
Washington	J. C. Brennan.....	Wooster.....	Sept. 15, 16, 17 and 18.....	Wooster
Wayne	I. N. Kinney.....	Weston	Sept. 29 and 30 and Oct. 1, 2 and 3.....	Bowling Green
Wood.....	J. O. Avery.....	Upper Sandusky	Oct. 5, 6, 7 and 8.....	Upper Sandusky
Wyandot	Oscar Billhardt.....			

TABLE II—CATTLE.

Counties.	Short horns.			Devons.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	9	\$45 00	\$40 00	.....	.....	.....
Allen	10	63 00	25 70	.....	.....	.....
Ashtabula	17	61 00	39 00	24	\$61 00	\$48 00
Athens	9	50 00	29 00	.....	50 00	.....
Auglaize	3	60 00	15 00	.....	60 00	.....
Belmont	10	56 00	35 00	.....	56 00	.....
Brown	11	51 00	51 00	.....	.....	.....
Butler	14	93 00	66 00	.....	.....	.....
Carroll	24	72 00	61 00	.....	.....	.....
Champaign	32	79 00	74 00	.....	.....	.....
Clark	14	89 00	44 75	17	89 00	57 75
Clermont	15	73 00	59 00	.....	.....	.....
Columbiana	39	57 00	53 00	.....	.....	.....
Coshocton	10	112 00	58 00	34	112 00	105 00
Crawford	15	62 00	50 00	9	70 00	24 00
Cuyahoga .....	.....	31 50	.....	.....	31 50	.....
West Cuyahoga .....	.....	52 75	.....	.....	52 75	.....
Darke	32	115 00	98 10	.....	.....	.....
Delaware	11	46 00	33 00	.....	.....	.....
Erie .....	.....	75 00	.....	.....	.....	.....
Fairfield .....	.....	.....	.....	.....	.....	.....
Fayette .....	.....	.....	.....	.....	.....	.....
Fulton	9	63 00	29 50	.....	.....	.....
Geauga	26	46 00	40 00	18	46 00	29 00
Greene	12	102 00	73 00	.....	.....	.....
Guernsey .....	.....	78 00	.....	.....	78 00	.....
Hamilton .....	.....	104 00	.....	.....	.....	.....
Hancock	7	64 00	29 00	.....	.....	.....
Hardin .....	.....	74 00	.....	10	74 00	46 00
Harrison	22	56 00	30 00	.....	.....	.....
Highland .....	.....	.....	.....	.....	.....	.....
Hocking .....	.....	.....	.....	.....	.....	.....
Holmes .....	.....	43 50	.....	.....	.....	.....
Huron .....	.....	.....	.....	.....	.....	.....
Jackson .....	.....	.....	.....	.....	.....	.....
Jefferson	25	69 00	83 00	.....	.....	.....
Lake .....	.....	.....	.....	.....	.....	.....
Lawrence	5	46 00	17 00	.....	.....	.....
Licking	11	92 00	67 00	33	86 00	83 00
Logan	23	84 00	51 50	.....	.....	.....
Lorain .....	.....	86 00	56 50	.....	86 00	58 50
Lucas	10	108 00	71 00	11	89 00	74 00
Madison	13	123 00	98 50	.....	.....	.....
Mahoning	23	83 00	71 00	.....	.....	.....
Marion	30	65 00	46 00	.....	65 00	.....
Medina	20	61 50	73 50	.....	.....	.....
Mercer	9	77 00	50 00	13	77 00	77 00
Miami	10	98 00	59 00	20	98 00	66 00
Monroe	8	46 00	24 00	.....	.....	.....
Morgan	3	36 00	4 80	11	34 00	14 40

TABLE II—CATTLE—Continued.

Counties.	Short horns.			Devons.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Morrow	6	\$52 00	\$16 00			
Muskingum		81 00		19	\$81 00	\$64 25
Noble	6	57 00	18 00			
Ottawa		55 00			50 00	
Paulding	14	66 00	42 00			
Perry	11	47 50	27 00	14	47 50	42 00
Portage		44 00			44 00	
Preble	10	82 00	58 00			
Putnam	20	90 00	74 00	30	90 00	81 00
Richland		64 00		17	64 00	57 00
Ross	17	81 00	76 00			
Sandusky	15	96 00	64 00			
Scioto		58 00				
Shelby	11	61 00			46 00	
Stark	40	112 00	103 00			
Summit	18	77 00	33 00		77 00	
Trumbull	35	111 00	105 00			
Union	18	76 00	59 00			
Van Wert	15	88 00	106 00		88 00	
Vinton						
Warren	4	52 00	16 00		43 00	
Washington	11	40 00	19 50	7	40 00	17 50
Wayne	1	60 00	1 00			
Wood	2	73 00	7 00	12	62 00	42 00
Wyandot	9	77 00	41 00			
Totals	804	\$4,758 75	\$2,671 35	299	\$2,007 75	\$986 40

TABLE II—CATTLE—Continued.

Counties.	Polled breeds.			Herefords.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams						
Allen	28	\$126 00	\$81 75			
Ashtabula.....	20	122 00	80 00			
Athens	3	50 00	11 00	4	\$50 00	\$17 00
Auglaize.....	24	120 00	87 00		60 00	
Belmont.....	11	56 00	39 00		56 00	
Brown	1	51 00	6 00			
Butler	22	186 00	119 00	14	93 00	83 00
Carroll.....	16	50 00	35 00			
Champaign.....	27	237 00	115 00			
Clark	57	267 00	118 50	7	89 00	28 50
Clermont.....						
Columbiana.....		57 00				
Coshocton.....	14	112 00	78 50	34	112 00	103 00
Crawford	14	70 00	23 00			
Cuyahoga.....	2	31 50	4 50		31 50	
West Cuyahoga.....	13	52 75	40 75	13	52 75	37 75
Darke	61	230 00	201 90			
Delaware	14	92 00	37 00			
Erie	18	75 00	64 00	13	75 00	46 00
Fairfield						
Fayette						
Fulton	13	126 00	39 50	6	63 00	21 00
Geauga	30	92 00	63 00		46 00	
Greene	29	204 00	175 00			
Guernsey		78 00		10		5 75
Hamilton	29	208 00	197 00	15	104 00	102 00
Hancock	28	128 00	108 00			
Hardin	2	74 00	6 00	3	74 00	5 00
Harrison	5	56 00	7 00			
Highland.....						
Holmes		43 50				
Huron		45 00		1	45 00	5 00
Jefferson						
Lake						
Lawrence						
Licking	8	94 00	62 00			
Logan		168 00			84 00	
Lorain		86 00	75 50		86 00	64 00
Lucas		100 00		13	89 00	71 00
Madison	24	210 00	121 00			
Mahoning	15	83 00	67 00	14	83 00	60 00
Marion		65 00			65 00	
Medina.....	13	45 00	26 50	10	45 00	27 00
Mercer	14	77 00	68 00			
Miami		98 00		5	98 00	28 00
Monroe	7	46 00	22 00			
Morgan		36 00				
Morrow	13	52 00	45 00	5	52 00	18 00
Muskingum	27	162 00	104 75	13	81 00	61 50

TABLE II—CATTLE—Continued.

Counties.	Polled breeds.			Herefords.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble						
Ottawa		\$54 00			\$56 00	
Paulding	20	64 50	\$56 00			
Perry.....	5	47 50	18 00			
Portage	10	44 00	29 00		44 00	
Preble	8	164 00	55 00	19	82 00	\$80 00
Putnam	53	180 00	121 00	17	90 00	57 00
Richland	9	64 00	45 00		64 00	
Ross.....	16	157 00	93 00		56 00	
Sandusky.....	13	96 00	60 00	11	96 00	54 00
Scioto						
Shelby	6	61 00			61 00	
Stark.....	52	212 00	203 00	20	112 00	98 00
Summit	35	154 00	131 00	16	77 00	62 50
Trumbull.....	27	111 00	105 00			
Union.....	33	203 00	102 00			
Van Wert.....	17	88 00	73 00		88 00	
Vinton						
Warren.....		43 00				
Washington	10	60 00	18 50			
Wayne						
Wood	31	186 00	86 00	17	62 00	46 00
Wyandot.....	17	66 00	44 00			
Totals	964	\$6,396 75	\$3,568 65	280	\$2,522 25	\$1,181 00

TABLE II—CATTLE—Continued.

Counties.	Jerseys.			Holsteins.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	9	\$45 00	\$33 00			
Allen.....	24	63 00	59 00		\$63 00	
Ashtabula.....	36	61 00	56 00			
Athens.....	6	50 00	20 00	3	50 00	\$10 00
Auglaize.....	19	60 00	29 00		60 00	
Belmont.....	4	56 00	23 00	7	56 00	30 00
Brown	36	51 00	51 00			
Butler	27	94 00	88 00	15	93 00	88 00
Carroll.....	11	50 00	34 00	6	50 00	24 00
Champaign.....	60	79 00	76 00	20	83 00	73 00
Clark	73	178 00	130 50	17	89 00	57 00
Clermont.....	53	73 00	73 00	6	58 00	26 00
Columbiana.....	32	57 00	57 00	19	57 00	46 00
Coshocton.....	22	112 00	92 50	12	112 00	68 50
Crawford.....	10	70 00	35 00			
Cuyahoga.....	11	31 50	17 50	17	31 50	24 50
West Cuyahoga.....	20	52 75	43 25	16	52 75	34 75
Darke.....	55	115 00	96 30	14	115 00	99 90
Delaware.....	15	46 00	40 00			
Erie.....	33	75 00	72 00	19	75 00	66 00
Fairfield						
Fayette						
Fulton.....	11	63 00	37 00	4	63 00	13 50
Geauga.....	52	46 00	46 00	38	46 00	46 00
Greene.....	26	204 00	182 00			
Guernsey.....		78 00			78 00	
Hamilton	28	104 00	93 00	14	104 00	104 00
Hancock.....	26	64 00	58 00		64 00	
Hardin.....	2	74 00		23	74 00	55 00
Harrison						
Highland.....	4	25 00	25 00			
Holmes.....	7	43 50	10 00		43 50	
Huron.....	1	45 00			45 00	
Jefferson.....	37	69 00	52 00	13	69 00	48 00
Lake.....						
Lawrence.....	21	44 00	43 50	1	48 00	2 00
Licking.....	20	94 00	86 00	12	35 00	28 00
Logan.....	19	84 00	56 00		84 00	
Lorain.....		86 00	50 00		86 00	70 00
Lucas.....	18	106 00	102 00	18	107 00	100 00
Madison.....	27	123 00	120 00		123 00	
Mahoning.....	49	83 00	83 00	30	83 00	\$76 00
Marion.....	25	65 00	19 00	6	65 00	19 00
Medina.....	36	45 00	45 00	7	45 00	21 00
Mercer.....	5	76 50	23 00			
Miami.....	28	98 00	94 00	17	98 00	61 00
Monroe.....	4	46 00	17 00	2	46 00	9 00
Morgan.....	5	34 00	4 80		36 00	
Morrow.....	38	52 00	52 00	15	52 00	40 00
Muskingum.....	21	81 00	72 00		81 00	

TABLE II—CATTLE—Continued.

Counties.	Jerseys.			Holsteins.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble						
Ottawa		\$58 00			\$52 00	
Paulding	12	63 00	\$32 00	12	66 00	23 00
Perry						
Portage	5	44 00	14 50	1	44 00	2 00
Preble	†33	82 00	78 00	15	82 00	77 00
Putnam	32	90 00	81 00	27	90 00	81 00
Richland	30	64 00	59 00			
Ross	17	73 00	70 00	14	63 00	55 00
Sandusky	26	96 00	85 00	27	96 00	78 00
Scioto	17	52 00	52 00	13	52 00	50 00
Shelby	17	61 00			61 00	
Stark	44	112 00	112 00		112 00	
Summit	28	77 00	73 50	4	77 00	14 00
Trumbull	41	111 00	102 00	34	111 00	106 00
Union	41	76 00	78 00	23	76 00	61 00
Van Wert	16	88 00	67 00	18	88 00	135 00
Vinton						
Warren	20	52 00	48 00			
Washington	12	40 00	14 50	11	39 00	15 00
Wayne	29	56 00	31 50	13	60 00	17 25
Wood	42	68 00	57 00	21	88 00	78 00
Wyandot	4	65 00	15 00	6	64 00	24 00
Totals	1,532	\$4,780 25	\$3,566 35	610	\$3,942 75	\$2,156 40

† Includes Devons.

TABLE II—CATTLE—Continued.

Counties.	Ayreshires.			Any other breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				11	\$21 00	\$19 00
Allen				7	21 00	14 50
Ashtabula	21	\$61 00	\$53 00	79	273 00	151 00
Athens	3	16 00	16 00	4	50 00	13 00
Auglaize				21	115 00	39 00
Belmont		56 00				
Brown						
Butler						
Carroll	2	33 00	6 00			
Champaign						
Clark		89 00				
Clermont						
Columbiana				12	46 00	24 00
Coshocton				20	112 00	98 50
Crawford						
Cuyahoga		31 50		22	36 50	15 50
West Cuyahoga.....	15	52 75	42 75	11	48 00	37 50
Darke				21	160 00	160 00
Delaware				8	92 00	18 00
Erie	27	75 00	63 00	12	22 00	22 00
Fairfield.....						
Fayette.....						
Fulton.....		63 00		15	30 00	27 00
Geauga.....	12	46 00		86	102 50	86 00
Greene					50 00	
Guernsey.....						
Hamilton.....						
Hancock				25	65 00	65 00
Hardin						
Harrison				20	37 00	21 50
Highland.....						
Holmes				7	33 00	30 50
Huron		45 00				
Jefferson.....				15	43 00	25 00
Lake						
Lawrence				8	32 00	21 50
Licking.....				21	94 00	58 00
Logan.....		84 00		11	119 00	31 00
Lorain.....		86 00	75 50		127 00	81 50
Lucas		89 00			36 00	
Madison.....						
Mahoning						
Marion				17	65 00	52 00
Medina	9	45 00	34 00	61	91 00	76 00
Mercer				28	169 00	129 00
Miami					193 00	
Monroe				6	46 00	17 00
Morgan.....		34 00		10	23 00	13 80
Morrow						
Muskingum				14	60 00	60 00

TABLE II—CATTLE—Continued.

Counties.	Ayrshires.			Any other breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble.....				4	\$36 00	\$7 50
Ottawa.....		\$54 00				
Paulding.....				6	40 50	18 00
Perry.....						
Portage.....	9	44 00	\$17 50	13	51 75	27 75
Preble.....				13	58 00	46 00
Putnam.....				65	198 00	160 00
Richland.....		64 00		†11	46 00	46 00
Ross.....						
Sandusky.....				35	123 00	91 00
Scioto.....				12	70 00	40 00
Shelby.....				7	27 00	
Stark.....				26	132 00	88 00
Summit.....				11	101 00	34 00
Trumbull.....						
Union.....						
Van Wert.....						
Vinton.....						
Warren.....				12	67 00	67 00
Washington.....				12	31 00	32 00
Wayne.....						
Wood.....		74 00		8	42 00	42 00
Wyandot.....				4	44 00	34 00
Totals.....	98	\$1,142 25	\$307 75	811	\$3,449 25	\$2,140 05

†Includes sweepstakes.

TABLE II—CATTLE—Continued.

Counties.	Fat cattle and work oxen.		
	Number of entries.	Amount offered.	Amount awarded.
Adams	5	\$10 00	\$10 00
Allen			
Ashtabula	8	73 00	19 00
Athens	2	32 00	7 00
Auglaize			
Belmont	3	32 00	12 00
Brown	3	13 00	13 00
Butler			
Carroll	4	21 00	14 00
Champaign			
Clark	1	55 00	6 00
Clermont			
Columbiana			
Coshocton	6	20 00	18 00
Crawford	2	24 00	8 00
Cuyahoga			
West Cuyahoga	2	13 50	2 00
Darke			
Delaware			
Erie			
Fairfield			
Fayette			
Fulton	1	15 00	
Geauga	16	81 00	31 50
Greene			
Guernsey		18 00	
Hamilton			
Hancock			
Hardin	2	70 00	12 00
Harrison			
Highland			
Holmes			
Huron			
Jefferson			
Lake			
Lawrence	5	32 00	20 00
Licking	1	8 00	8 00
Logan	3	24 00	5 00
Lorain		54 00	25 00
Lucas			
Madison			
Mahoning	†24	105 00	67 00
Marion	†39	99 00	91 00
Medina	4	16 50	7 00
Mercer			
Miami			
Monroe		16 00	7 00
Morgan	9	18 00	7 20
Morrow	11	24 00	24 00
Muskingum		11 00	

TABLE II—CATTLE—Concluded.

Counties.	Fat cattle and work oxen.		
	Number of entries.	Amount offered.	Amount awarded
Noble			
Ottawa			
Paulding	12	\$27 00	\$22 00
Perry	3	36 00	8 00
Portage	15	81 50	40 00
Preble		12 00	
Putnam	4	20 00	12 00
Richland			
Ross			
Sandusky	8	23 00	23 00
Scioto			
Shelby.....	2	15 00	
Stark			
Summit	3		13 00
Trumbull	8	29 00	29 00
Union			
Van Wert.....			
Vinton			
Warren			
Washington.....	2	44 00	3 00
Wayne.....			
Wood.....	11	47 00	35 00
Wyandot.....			
Totals	221	\$1,219 50	\$598 70

†Includes sweepstakes.

TABLE II—HORSES.

Counties.	Thoroughbreds. (Running horses.)			Roadsters.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				26	\$171 00	\$171 00
Allen				7	25 50	19 50
Ashtabula				50	115 00	86 00
Athens	2	\$35 00	\$15 00	8	65 00	23 00
Auglaize	10	308 00	231 00	8	58 00	17 00
Belmont	6	47 00	27 00	15	111 00	54 00
Brown				33	138 00	126 00
Butler.....				128	230 00	230 00
Carroll				40	91 00	76 00
Champaign.....				88	158 00	133 00
Clark				34	95 00	66 75
Clermont.....				51	117 00	109 00
Columbiana				44	93 00	89 00
Coshocton.....	5	95 50	32 00	44	161 00	130 00
Crawford ...	16	200 00	150 00	12	99 00	18 00
Cuyahoga				25	52 50	27 50
West Cuyahoga.....				18	52 50	24 50
Darke.....				36	125 00	106 75
Delaware.....				39	83 00	50 00
Erie				33	111 00	63 00
Fairfield						
Fayette.....						
Fulton				31	154 50	88 00
Geauga				88	162 00	110 00
Greene.....				44	95 00	77 00
Guernsey				3	93 00	3 00
Hamilton				117	168 00	168 00
Hancock				33	106 00	63 00
Hardin.....	5	150 00	120 00	27	95 00	55 00
Harrison						
Highland				24	41 00	41 00
Holmes				45	229 00	127 00
Huron				16	88 25	36 50
Jefferson				38	97 00	70 00
Lake						
Lawrence				24	62 00	51 00
Licking	12	91 00	67 00	56	253 00	198 00
Logan.....				84	292 00	200 00
Lorain					72 00	60 50
Lucas				12	143 00	63 00
Madison	31	106 00	78 00	70	121 00	121 00
Mahoning				71	183 00	142 00
Marion.....				51	302 00	119 00
Medina				46	72 00	63 50
Mercer	4	82 00	22 00	31	122 00	93 50
Miami				60	219 00	174 00
Monroe.....				6	26 00	20 00
Morgan.....	2	70 00	3 60	30	80 00	21 00
Morrow				55	98 00	69 00
Muskingum				42	149 00	120 50

TABLE II—HORSES—Continued.

Counties.	Thoroughbreds. (Running horses.)			Roadsters.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble				11	\$18 00	\$14 00
Ottawa					28 50	
Paulding	2	\$27 00	\$20 00	17	82 00	58 00
Perry				16	78 00	60 50
Portage				34	184 00	75 50
Preble				52	134 00	126 00
Putnam				125	320 00	225 00
Richland				36	178 00	63 00
Ross				17	147 00	103 00
Sandusky				28	128 00	67 00
Scioto		350 00	160 00	16	69 00	54 00
Shelby				51	124 00	
Stark						
Summit				71	231 00	166 00
Trumbull				56	100 00	72 00
Union				44	66 00	74 00
Van Wert				40	162 00	55 00
Vinton						
Warren	5	150 00	150 00	45	92 00	87 00
Washington	1	55 00	6 00	16	53 50	25 00
Wayne				23	108 00	35 00
Wood				56	211 00	
Wyandot				31	147 00	113 00
Totals	101	\$1,766 50	\$1,081 60	2,579	\$8,337 25	\$5,447 50

TABLE II—HORSES—Continued.

Counties.	General purpose.			Draft, (English).		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	66	\$148 00	\$129 00	*37	\$167 00	\$94 00
Allen.....	5	35 50	10 00	4	96 00	10 00
Ashtabula.....	48	115 00	87 00	28	115 00	74 00
Athens	24	65 00	59 00	9	65 00	14 00
Auglaize	18	58 00	31 00	5	78 00	12 00
Belmont	15	123 00	37 00	*22	117 00	58 00
Brown	39	122 00	114 00	26	122 00	98 00
Butler.....	131	230 00	230 00			
Carroll	38	91 00	68 00	*30	91 00	64 00
Champaign	53	92 00	77 00	53	149 00	110 00
Clark.....	23	108 00	49 75	19	190 00	50 25
Clermont	81	150 00	146 00	57	153 00	137 00
Columbiana	35	93 00	78 00	*29	93 00	76 00
Coshocton	64	161 00	138 50	51	162 00	123 50
Crawford.....				11	94 00	35 00
Cuyahoga.....	28	52 50	38 50	*8	52 50	17 00
West Cuyahoga.....	10	52 50	18 50	7	52 50	19 00
Darke.....	18	125 00	86 40	11	125 00	66 60
Delaware	12	57 00	22 00	15	65 00	34 00
Erie	35	111 00	62 00	9	111 00	31 00
Fairfield						
Fayette						
Fulton	29	70 50	44 50	*17	82 50	47 00
Geauga.....	86	106 00	75 50	34	81 00	50 00
Greene.....	32	77 00	72 00	*3	106 00	25 00
Guernsey.....	1	93 00	1 00	5	93 00	3 00
Hamilton	109	221 00	218 00	3	169 00	26 00
Hancock	22	105 00	64 00	13	95 00	61 00
Hardin.....	19	95 00	35 00	1	80 00	7 00
Harrison						
Highland.....	22	41 00	41 00	*7	41 00	41 00
Holmes.....	32	100 50	64 00	*19	155 50	60 50
Huron	12	64 00	17 00			
Jefferson.....	39	68 00	62 00	17	120 00	58 00
Lake						
Lawrence	28	47 00	33 00	4	47 00	18 00
Licking	29	120 00	107 00	5	134 00	52 00
Logan.....	47	179 50	113 50		179 50	
Lorain.....		70 50	40 00			
Lucas.....	4	50 00	42 00	8	142 00	100 00
Madison.....	28	106 00	76 50		96 00	
Mahoning	37	112 00	63 00	8	75 00	31 00
Marion.....	50	103 00	75 00	*71	275 00	123 00
Medina.....	39	46 50	39 50	*12	54 00	43 50
Mercer.....	17	122 00	52 00	*19	224 50	94 50
Miami.....	60	206 00	146 00	*78	393 00	296 00
Monroe						
Morgan	18	58 00	13 20	5	48 00	7 20
Morrow	28	98 00	74 00	1	74 00	2 00
Muskingum	42	149 00	112 00	*17	149 00	78 00

TABLE II—HORSES—Continued.

Counties.	General purpose.			Draft, (English).		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble	11	\$105 00	\$35 50	6	\$37 50	\$23 00
Ottawa	3	73 00	.....	3	72 00	6 50
Paulding	19	81 00	65 50	8	93 00	46 00
Perry	15	78 00	58 50	*9	78 00	40 50
Portage	49	92 00	57 00	*20	92 00	39 50
Preble	54	134 00	130 00	*12	124 00	68 00
Putnam	40	149 00	103 00	11	121 00	40 00
Richland	9	74 00	31 00	5	74 00	8 00
Ross	10	112 00	55 00	17	132 00	94 00
Sandusky	59	142 00	110 00	35	142 00	81 00
Scioto	2	28 00	12 00	*3	86 00	16 00
Shelby	38	147 00	.....	*31	197 00	.....
Stark	42	127 00	92 50	*32	345 00	126 50
Summit	30	89 50	48 50	*25	172 50	97 00
Trumbull	35	112 00	64 00	26	99 00	53 00
Union	40	65 00	61 00	2	111 00	16 00
Van Wert	23	162 00	70 00	9	117 00	123 00
Vinton .....	.....	.....	.....	.....	.....	.....
Warren	38	108 00	98 00	10	54 00	36 00
Washington	10	65 50	29 00	4	61 00	11 00
Wayne	6	45 00	8 50	13	63 00	19 25
Wood	7	37 00	37 00	31	145 00	120 00
Wyandot	21	146 00	72 00	*23	148 00	103 00
Totals	2,134	\$6,658 00	\$4,400 35	1,113	\$7,576 00	\$3,514 30

*Includes all draft classes.

TABLE II—HORSES—Continued.

Counties.	Draft, (French.)			Speed horses.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams.....						
Allen.....	18	\$96 00	\$47 50	41	\$1,025 00	\$817 75
Ashtabula.....				74	1,600 00	1,385 00
Athens.....					1,530 00	431 00
Anglaize.....	7	78 00	29 00	5	1,250 00	750 00
Belmont.....				16	665 00	185 00
Brown.....						
Butler.....				127	2,690 00	2,690 00
Carroll.....				84	1,000 00	727 50
Champaign.....	12	68 00	36 00	88	2,400 00	2,235 00
Clark.....	4	95 00	14 25	76	2,800 00	2,800 00
Clermont.....				29	600 00	525 00
Columbiana.....				37	675 00	640 00
Coshocton.....				52	1,900 00	1,825 00
Crawford.....				10	770 00	352 50
Cuyahoga.....				80	680 50	680 50
West Cuyahoga.....				35	1,200 00	745 67
Darke.....	10	125 00	63 90	87	2,400 00	2,322 50
Delaware.....				40	815 00	640 00
Erie.....	15	67 50	14 00		1,500 00	1,012 00
Fairfield.....						
Fayette.....						
Fulton.....				29	590 00	478 00
Geauga.....				71	1,100 00	1,050 00
Greene.....				85	1,925 00	1,606 80
Guernsey.....					374 00	1 00
Hamilton.....				102	2,950 00	2,213 00
Hancock.....	9	95 00	44 00	13	98 00	64 00
Hardin.....	7	80 00	33 00	35	1,250 00	980 00
Harrison.....				22	200 00	200 00
Highland.....						
Holmes.....				41	1,150 00	415 00
Huron.....						
Jefferson.....				22	560 00	460 00
Lake.....						
Lawrence.....				9	150 00	125 00
Licking.....				70	2,725 00	2,350 00
Logan.....	6	127 50	21 00	47	1,500 00	1,500 00
Lorain.....		126 00	90 00			
Lucas.....	9	142 00	45 00	107	5,300 00	4,551 53
Madison.....	4	96 00	20 00	71	2,400 00	1,925 00
Mahoning.....	5	38 00	30 00			
Marion.....				41	1,375 00	450 80
Medina.....				28	1,200 00	906 50
Mercer.....						
Miami.....				69	2,150 00	1,780 00
Monroe.....				37	760 00	685 00
Morgan.....	6	50 00	9 00	19	690 00	450 00
Morrow.....	12	74 00	48 00	75	1,400 00	1,400 00
Muskingum.....				60	2,075 00	2,030 00

TABLE II—HORSES—Continued.

Counties.	Draft, (French.)			Speed horses.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble.....				20	\$220 00	\$220 00
Ottawa.....	1	\$76 00	\$4 00	15	500 00	296 60
Paulding.....				30	900 00	710 00
Perry.....				104	2,250 00	1,275 00
Portage.....				27	1,575 00	906 18
Preble.....					1,275 00	800 00
Putnam.....	24	129 00	79 00	65	2,000 00	2,000 00
Richland.....	8	74 00	14 00		2,000 00	2,000 00
Ross.....					2,800 00	2,755 00
Sandusky.....	11	107 00	37 00	38	1,500 00	747 50
Scioto.....					3,100 00	2,075 00
Shelby.....				37	1,272 50	1,247 50
Stark.....					1,367 18	1,397 18
Summit.....				56	2,150 00	1,197 50
Trumbull.....				53	1,400 00	1,400 00
Union.....	9	81 00	33 00	95	2,080 00	1,365 50
Van Wert.....		117 00			982 00	982 00
Vinton.....						
Warren.....				71	1,100 00	1,010 00
Washington.....						
Wayne.....				47	1,400 00	1,090 00
Wood.....	20	145 00	80 00	118	3,650 00	1,740 00
Wyandot.....						
Totals.....	197	\$2,087 00	\$791 65	2,710	\$91,004 18	\$71,601 01

TABLE II—HORSES—Continued.

Counties.	Horses, all other classes.			Mules and asses.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	52	\$145 00	\$130 00	8	\$32 00	\$23 00
Allen	36	222 00	81 00	.....	.....	.....
Ashtabula	21	65 00	48 00	1	24 00	5 00
Athens	49	196 00	137 00	2	27 00	4 00
Auglaize	52	304 00	101 00	1	18 00	4 00
Belmont	6	.....	6 00	.....	30 00	.....
Brown	96	261 00	250 00	5	32 00	22 00
Butler	126	452 00	397 00	.....	.....	.....
Carroll	12	43 00	39 00	.....	.....	.....
Champaign	53	37 00	37 00	.....	.....	.....
Clark	48	634 00	122 25	4	59 00	12 00
Clermont	57	107 00	107 00	46	83 00	72 00
Columbiana	30	93 00	87 00	.....	.....	.....
Coshocton	7	91 00	47 00	.....	.....	.....
Crawford	26	216 00	81 00	.....	.....	.....
Cuyahoga	30	105 00	105 00	.....	.....	.....
West Cuyahoga	13	52 00	26 00	.....	.....	.....
Darke	57	362 00	259 20	.....	.....	.....
Delaware	37	187 00	83 00	.....	.....	.....
Erie	26	69 50	26 00	.....	.....	.....
Fairfield .....	.....	.....	.....	.....	.....	.....
Fayette .....	.....	.....	.....	.....	.....	.....
Fulton	24	151 50	59 50	.....	.....	.....
Geauga	30	23 00	19 00	.....	.....	.....
Greene	21	72 00	61 00	.....	.....	.....
Guernsey .....	.....	86 00	.....	1	17 00	1 50
Hamilton	77	274 00	274 00	.....	20 00	.....
Hancock	72	380 00	194 00	.....	.....	.....
Hardin	18	100 00	25 00	.....	.....	.....
Harrison	136	.....	164 75	.....	.....	.....
Highland	30	105 00	105 00	.....	.....	.....
Holmes	6	9 00	9 00	.....	.....	.....
Huron	9	35 00	27 00	.....	.....	.....
Jefferson	19	68 00	52 00	.....	.....	.....
Lake .....	.....	.....	.....	.....	.....	.....
Lawrence .....	.....	.....	.....	4	33 00	16 00
Licking	9	63 00	43 00	.....	.....	.....
Logan	30	169 50	104 00	.....	.....	.....
Lorain .....	.....	158 50	96 50	.....	.....	.....
Lucas	6	329 00	74 00	.....	.....	.....
Madison	72	323 00	196 50	6	20 00	18 00
Mahoning	16	\$77 00	\$39 00	.....	.....	.....
Marion	81	119 00	112 00	.....	.....	.....
Medina	86	183 00	141 00	.....	.....	.....
Mercer	12	198 00	44 00	.....	.....	.....
Miami	65	335 00	161 00	19	\$84 00	\$47 00
Monroe	35	136 00	107 00	5	33 00	20 00
Morgan .....	.....	.....	.....	1	20 00	2 00
Morrow	50	80 00	70 00	.....	.....	.....
Muskingum	34	91 00	83 75	3	33 00	11 00

TABLE II—HORSES—Concluded.

Counties.	Horses, all other classes.			Mules and asses.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble.....	3	45 00	15 00	1	21 00	.....
Ottawa.....	.....	.....	.....	.....	.....	.....
Paulding.....	17	150 00	33 00	.....	.....	.....
Perry.....	.....	.....	.....	.....	.....	.....
Portage.....	.....	.....	.....	.....	.....	.....
Preble.....	39	168 00	132 00	11	53 00	48 00
Putnam.....	59	394 00	250 00	5	26 00	26 00
Richland.....	32	111 00	61 00	.....	.....	.....
Ross.....	6	60 00	27 00	.....	.....	.....
Sandusky.....	13	62 00	32 00	.....	.....	.....
Scioto.....	12	71 00	55 00	.....	.....	.....
Shelby.....	16	42 00	.....	.....	.....	.....
Stark.....	11	93 00	.....	.....	.....	.....
Summit.....	37	195 50	117 50	.....	.....	.....
Trumbull.....	.....	.....	50 00	.....	.....	.....
Union.....	4	28 00	10 00	.....	.....	.....
Van Wert.....	57	300 00	255 00	5	52 00	18 00
Vinton.....	.....	.....	.....	.....	.....	.....
Warren.....	23	157 00	105 00	.....	.....	.....
Washington.....	2	16 00	6 00	7	28 25	7 50
Wayne.....	.....	.....	.....	.....	.....	.....
Wood.....	.....	290 00	224 00	5	26 00	12 00
Wyandot.....	19	96 00	72 00	.....	.....	.....
Totals.....	2,122	\$9,485 50	\$5,875 95	140	\$771 25	\$369 00

TABLE II—SHEEP.

Counties.	Fine wools.			Coarse and long wools.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	11	\$54 00	\$38 00	14	\$54 00	\$45 00
Ailen	19	71 00	31 50	106	142 00	123 50
Ashtabula	16	36 00	36 00	175	241 00	224 00
Athens	33	98 00	98 00	22	66 00	54 00
Auglaize	13	43 00	43 00	60	172 00	147 00
Belmont	19	77 00	63 00	1	73 00	3 00
Brown	21	29 00	29 00	55	116 00	120 00
Butler	23	68 00	48 00	126	300 00	287 00
Carroll	34	76 00	75 00	18	76 00	64 00
Champaign	126	156 00	150 00	95	208 00	188 00
Clark	61	94 00	59 00	117	252 00	167 75
Clermont				42	108 00	102 00
Columbiana	41	61 00	60 00	11	71 00	31 00
Coshocton	49	110 00	110 00	60	208 00	183 00
Crawford	11	30 00	25 00	23	90 00	58 00
Cuyahoga	58	54 00	54 00			
West Cuyahoga	12	24 00	21 00	69	90 75	81 25
Darke	37	46 00	41 46	108	214 00	195 60
Delaware	42	50 00	50 00	36	100 00	63 00
Erie		58 00		37	123 00	81 00
Fairfield						
Fayette						
Fulton	40	63 00	58 00	23	58 50	44 00
Geauga	44	69 00	64 00	164	160 50	143 00
Greene	12	41 00	41 00	69	191 00	191 00
Guernsey		92 00			57 00	
Hamilton	59	153 00	130 00	28	37 00	37 00
Hancock	35	68 00	68 00	63	130 00	107 00
Hardin	42	62 00	53 00	60	93 00	67 00
Harrison	2	72 00	8 50	28	54 00	20 00
Highland				4	20 00	20 00
Holmes		85 50		9	112 00	20 50
Huron		25 00		6	47 00	16 00
Jefferson	35	96 00	91 00	16	74 00	51 00
Lake						
Lawrence		9 00		6	27 00	18 00
Licking	81	120 00	99 00	51	190 00	160 00
Logan	7	49 00	19 50	32	104 00	49 50
Lorain		79 50	76 50		283 50	216 50
Lucas		100 00		56	259 50	87 50
Madison	22	42 50	42 50	49	154 00	138 00
Mahoning	44	62 00	62 00	71	124 00	124 00
Marion	40	98 00	90 00	†86	193 00	149 00
Medina	61	94 50	87 50	125	202 00	173 50
Mercer	15	47 00	41 00	89	189 00	187 00
Miami	18	42 00	38 00	74	210 00	122 00
Monroe	11	111 00	39 00	8	74 00	29 00
Morgan	31	50 00	26 40	11	43 00	9 00
Morrow	75	80 00	75 00	50	80 00	70 00
Muskingum	38	117 00	112 25	7	125 00	33 00

TABLE II—SHEEP—Concluded.

Counties.	Fine wools.			Coarse and long wools.		
	Number of entries.	Amount offered.	Amount awarded	Number of entries.	Amount offered.	Amount awarded.
Noble	12	\$38 50	\$35 50	6	\$39 50	\$15 00
Ottawa		55 00	.....	1	99 00	1 50
Paulding	24	27 00	23 00	31	51 00	33 00
Perry	16	54 00	24 00	12	27 00	27 00
Portage	35	54 00	48 00	27	196 00	75 00
Preble	14	35 00	31 00	53	132 00	114 00
Putnam	35	32 00	32 00	187	216 00	175 00
Richland.....	35	97 00	68 00	57	142 00	76 00
Ross	10	33 00	30 00	7	94 00	32 00
Sandusky	73	110 00	110 00	32	55 00	55 00
Scioto		19 00	.....	8	47 00	16 00
Shelby	12	40 00	.....	12	80 00	.....
Stark	85	123 00	108 00	46	270 00	248 00
Summit	52	167 50	135 50	48	146 00	128 50
Trumbull	27	39 00	38 00	34	78 00	69 00
Union	43	51 00	46 00	141	208 00	237 00
Van Wert	22	73 00	72 00	112	146 00	246 00
Vinton						
Warren	22	89 00	59 00	9	25 00	22 00
Washington	11	64 25	19 50	14	43 75	26 50
Wayne				15	78 00	17 50
Wood	8	55 00	35 00	19	93 00	62 00
Wyandot	4	57 00	21 00	18	65 00	62 00
Totals	1,878	\$4,476 25	\$3,289 55	3,249	\$8,328 00	\$6,238 60

† Includes sweepstakes

TABLE II—HOGS.

Counties.	Poland Chinas.			Berkshires.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams.....	10	\$27 00	\$27 00			
Allen.....	49	54 50	48 00	28	\$54 50	\$50 50
Ashtabula.....	14	42 00	38 00	22	42 00	42 00
Athens.....	16	25 00	25 00			
Auglaize.....	27	60 00	55 00	18	60 00	51 00
Belmont.....					22 00	
Brown.....	31	46 00	46 00	29	46 00	46 00
Butler.....	38	82 00	77 00	22	82 00	77 00
Carroll.....	6	45 00	14 00	7	45 00	26 00
Champaign.....	31	53 00	47 00		53 00	
Clark.....	43	74 00	50 25	12	74 00	30 00
Clermont.....	20	40 00	38 00	22	40 00	40 00
Columbiana.....	27	39 00	31 00	18	39 00	36 00
Coshocton.....	27	50 00	45 00	41	60 00	60 00
Crawford.....	28	39 00	37 00	14	39 00	32 00
Cuyahoga.....	14	22 50	20 00	5	22 50	12 00
West Cuyahoga.....	5	21 75	7 00	6	21 75	10 75
Darke.....	51	80 00	72 00	58	80 00	72 00
Delaware.....	37	40 00	38 00	6	40 00	8 00
Erie.....	13	33 00	33 00	10	33 00	33 00
Fairfield.....						
Fayette.....						
Fulton.....	24	33 00	27 00	4	33 00	11 00
Geauga.....	22	36 00	36 00	24	36 00	36 00
Greene.....	16	67 00	53 00	17	67 00	57 00
Guernsey.....		34 00				
Hamilton.....	25	82 00	68 00	43	82 00	82 00
Hancock.....	39	39 00	39 00	16	39 00	34 00
Hardin.....	10	48 00	20 00	14	48 00	30 00
Harrison.....	5	17 00	18 75			
Highland.....	5	25 00	25 00			
Holmes.....	28	43 00	41 00		43 00	
Huron.....	5	23 00	12 50		23 00	
Jefferson.....	13	29 00	29 00	14	29 00	28 00
Lake.....						
Lawrence.....	10	13 00	13 00			
Licking.....	80	109 00	109 00	72	109 00	109 00
Logan.....	27	99 00	45 50	14	99 00	40 50
Lorain.....		47 50	47 50		47 50	35 00
Lucas.....	8	45 00	42 30	3	45 00	
Madison.....	47	93 00	90 50	17	93 00	86 00
Mahoning.....	15	34 00	34 00	21	34 00	34 00
Marion.....	31	48 00	42 00	11	48 00	
Medina.....	23	42 00	42 00	40	42 00	40 50
Mercer.....	21	58 50	58 50	28	53 00	53 00
Miami.....	42	71 00	56 00	23	71 00	66 00
Monroe.....	8	35 00	31 00			
Morgan.....		15 00			15 00	
Morrow.....	25	36 00	36 00	11	36 00	24 00
Muskingum.....	34	79 00	79 00	28	59 00	59 00

TABLE II.—HOGS—Continued.

Counties.	Poland Chinas.			Berkshires.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble	2	\$22 50	\$3 50	.....	.....	.....
Ottawa .....	.....	25 00	.....	.....	\$25 00	.....
Paulding	24	66 00	48 00	17	66 00	\$35 00
Perry .....	.....	.....	.....	8	23 25	18 75
Portage	11	27 00	25 50	1	27 00	4 00
Preble	27	59 00	56 00	23	59 00	59 00
Putnam	36	42 00	40 00	28	42 00	40 00
Richland	37	48 00	48 00	27	48 00	45 00
Ross .....	.....	.....	.....	16	57 00	51 00
Sandusky	*111	155 00	151 00	.....	.....	.....
Scioto .....	.....	36 00	.....	11	36 00	36 00
Shelby	11	44 00	.....	6	44 00	.....
Stark	41	74 00	74 00	30	74 00	74 00
Summit	38	64 50	64 50	31	69 50	49 00
Trumbull .....	.....	.....	.....	15	27 00	21 00
Union	37	59 00	41 00	21	59 00	51 00
Van Wert	16	86 00	95 00	27	86 00	106 00
Vinton .....	.....	.....	.....	.....	.....	.....
Warren	3	60 00	9 00	13	47 00	36 00
Washington	5	26 00	10 00	7	26 00	15 00
Wayne	11	28 00	11 25	12	28 00	14 00
Wood	14	64 00	42 00	30	64 00	64 00
Wyandot	10	43 00	33 00	8	43 00	22 00
Totals	1,534	\$3,203 75	\$2,605 55	1,049	\$2,956 00	\$2,192 00

*Includes Berkshires.

TABLE II—HOGS—Continued.

Counties.	Chester Whites.			All other breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	4	\$17 00	\$8 00	2	\$17 00	\$9 00
Allen	19	54 50	47 00	43	109 00	92 00
Ashtabula	14	42 00	38 00	29	102 00	75 00
Athens				12	35 00	18 00
Auglaize	17	60 00	46 00	76	138 00	127 00
Belmont		22 00		2	86 00	6 00
Brown				33	51 00	51 00
Butler		82 00		8	82 00	44 00
Carroll	22	45 00	43 00			
Champaign	28	53 00	47 00	35	106 00	81 00
Clark	39	74 00	52 50	34	74 00	30 25
Clermont	3	40 00	13 00	13	40 00	31 00
Columbiana	24	39 00	39 00			
Coshocton	23	60 00	55 00	13	50 00	39 00
Crawford	10	39 00	26 00	4	39 00	12 00
Cuyahoga	7	22 50	13 00	8	22 50	6 00
West Cuyahoga	4	21 75	8 50	25	38 25	30 25
Darke	21	80 00	73 80	71	160 00	140 40
Delaware	42	40 00	38 00	10	46 00	23 00
Erie	5	33 00	20 00	12	66 00	37 00
Fairfield						
Fayette						
Fulton	1	33 00		21	66 00	45 50
Geauga	42	36 00	36 00	42	56 00	52 00
Greene	42	67 00	67 00			
Guernsey		22 00				
Hamilton	26	82 00	64 00	58	172 00	172 00
Hancock	24	39 00	39 00	13	18 00	18 00
Hardin	23	48 00	30 00	13	46 00	30 00
Harrison						
Highland						
Holmes	21	43 00	43 00	9	86 00	24 50
Huron	7	23 00	15 00			
Jefferson	5	29 00	17 00			
Lake						
Lawrence	3	13 00	8 00			
Licking	53	109 00	109 00	58	109 00	109 00
Logan	24	99 00	54 00	12	99 00	28 50
Lorain		47 50	37 50		95 00	72 50
Lucas	22	45 00	42 80			
Madison	30	93 00	81 00	37	93 00	93 00
Mahoning	39	\$64 00	\$54 00	6	\$20 00	\$15 00
Marion	23	48 00	42 00	34	71 00	23 00
Medina	32	50 00	50 00	91	100 00	91 50
Mercer				89	227 50	204 50
Miami	41	71 00	68 00	43	142 00	105 00
Monroe	6	35 00	22 00	1	35 00	4 00
Morgan	8	15 00	8 80	3	10 00	5 60
Morrow	17	36 00	28 00	25	36 00	36 00
Muskingum	19	67 00	67 00	9	59 00	26 50

TABLE II—Hogs—Concluded.

Counties.	Chester Whites.			All other breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble						
Ottawa		25 00			25 00	
Paulding				42	201 00	146 50
Perry						
Portage		27 00		6	54 00	16 50
Preble	14	59 00	40 00	4	20 00	20 00
Putnam	46	41 00	41 00	28	92 00	92 00
Richland	17	48 00	34 00	†25	75 00	50 00
Ross	14	46 00	40 00	9	51 00	25 00
Sandusky	16	60 00	52 00			
Scioto	10	36 00	36 00	4	10 00	10 00
Shelby	4	44 00		2	52 00	
Stark	22	74 00	74 00	26	74 00	73 00
Summit	11	69 50	44 00	13	64 50	51 50
Trumbull				29	63 00	53 00
Union	24	59 00	51 00	27	59 00	49 00
Van Wert	20	86 00	106 00	56	172 00	180 00
Vinton						
Warren	11	47 00	27 00	14	60 00	50 00
Washington	9	26 00	16 00	10	43 00	17 00
Wayne	7	28 00	7 75			
Wood	18	64 00	46 00	8	61 00	25 00
Wyandot	9	43 00	23 00	13	63 00	30 00
Totals	1,042	\$2,921 75	\$2,188 65	1,320	\$4,035 75	\$2,896 50

† Includes sweepstakes.

TABLE II—POULTRY AND MECHANIC ARTS.

Counties.	Poultry.			Mechanic arts.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	112	\$119 00	\$53 00	46	\$42 00	\$29 50
Allen	205	131 25	66 00	53	117 00	87 00
Ashtabula	103	119 00	34 30	10	47 75	10 00
Athens	78	98 00	47 50	44	110 00	28 00
Auglaize	127	190 00	75 00			
Belmont	96	450 00	93 00	52	203 00	47 00
Brown	160	115 00	85 00		40 00	40 00
Butler	464	164 50	151 25			
Carroll	66	60 00	35 50	19	83 00	39 00
Champaign	335	215 00	145 00	20	69 00	43 00
Clark	442	276 00	143 00	108		
Clermont	72	20 25	17 75	43	53 50	37 50
Columbiana	123	95 25	71 25	10	52 00	25 00
Coshocton	161	223 10	144 00	28	126 50	51 00
Crawford	360	84 00	53 00	10	100 00	65 00
Cuyahoga	344	55 00	55 00	100	75 00	75 00
West Cuyahoga	317	119 40	119 40	82	15 50	11 50
Darke	406	247 50	137 25	77	79 50	54 60
Delaware	241	99 00	63 00	41	83 00	24 00
Erie	254	74 75	59 25	62	152 50	57 50
Fairfield						
Fayette						
Fulton	166	152 10	95 40	17	42 50	25 50
Gauga	128	60 00	48 00	88	25 00	18 00
Greene	532	105 50	67 00			
Guernsey	40	48 00		125	75 00	
Hamilton	198	93 50	84 00	10	130 00	130 00
Hancock	187	159 00	107 00		17 00	17 00
Hardin	128	66 00	80 00	31	140 00	72 00
Harrison	12	78 00	9 37	18	31 00	5 00
Highland	75	26 50	26 50			
Holmes	24	39 50	17 40	5		
Huron	114	63 50	48 50	2		
Jefferson	33	38 40	14 98	35	106 50	42 40
Knox						
Lake						
Lawrence	28	38 00	19 00			
Licking	245	176 00	153 00	65	97 00	29 00
Logan	47	70 50	26 50	18	82 50	12 00
Lorain		190 00	173 45		203 00	168 50
Lucas	1,599	700 00	437 2			
Madison	162	151 50	110 50			
Mahoning	240	132 75	103 75	62	124 25	86 75
Marion	326	80 00	62 00	102	239 00	50 00
Medina	481		165 50	72	29 00	14 25
Mercer	400	144 00	136 00	5	37 75	5 23
Miami	452	198 00	136 00	90	50 00	50 00
Monroe	57	57 00	44 00	20	25 00	5 00
Morgan	223	92 00	50 40	24	66 00	9 30
Morrow	300	400 00	185 00			

TABLE II—POULTRY AND MECHANIC ARTS—Concluded.

Counties.	Poultry.			Mechanic arts.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Muskingum.....	333	\$233 85	\$157 00	4	\$142 00	\$21 75
Noble.....	35	26 50	25 00	11	64 00	15 50
Ottawa.....	2	32 00	75	31	110 00	14 50
Paulding.....	263	105 00	102 85	38	85 00	31 00
Perry.....	37	71 25	38 50	.....	21 00	.....
Portage.....	240	190 00	96 00	.....	.....	.....
Preble.....	208	106 00	90 00	.....	.....	.....
Putnam.....	220	118 00	97 00	78	117 00	108 00
Richland.....	438	174 75	120 00	4	14 00	12 00
Ross.....	151	164 00	135 00	27	131 00	92 00
Sandusky.....	290	245 00	166 00	180	291 00	91 00
Scioto.....	32	150 00	16 50	.....	68 00	.....
Shelby.....	252	163 00	10 00	48	76 75	.....
Stark.....	.....	600 00	437 25	.....	.....	.....
Summit.....	494	280 25	224 50	155	101 50	17 00
Trumbull.....	35	58 00	18 25	23	61 00	37 00
Union.....	270	106 10	106 10	65	48 25	42 00
Van Wert.....	424	244 00	244 00	51	95 00	40 00
Vinton.....	.....	.....	.....	.....	.....	.....
Warren.....	199	180 50	134 00	26	86 50	39 50
Washington.....	10	55 00	9 00	53	231 75	59 75
Wayne.....	81	86 50	15 37	100	.....	.....
Wood.....	43	78 00	23 00	.....	.....	.....
Wyandot.....	155	160 00	103 00	23	101 00	32 00
Totals.....	14,875	\$9,943 45	\$6,417 97	2,511	\$4,814 50	\$2,117 53

TABLE II—HORTICULTURE AND FLORICULTURE.

Counties.	Farm products.			Fruits.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	383	\$83 00	\$69 50	61	\$13 75	\$12 25
Allen	256	89 95	81 30	42	20 50	22 00
Ashtabula.....	556	152 00	106 75	865	139 75	82 50
Athens.....	24	50 00	10 00	450	150 00	95 75
Auglaize	555	100 00	100 00	141	25 00	25 00
Belmont	9	138 00	4 00	36	17 00	17 00
Brown	300	156 00	148 35	115	35 00	33 00
Butler	803	176 25	173 25	213	58 00	56 50
Carroll.....	374	89 25	82 00	458	22 25	18 75
Champaign.....	529	174 25	143 50	482	135 25	89 25
Clark	334	388 00	142 50	249	160 50	49 50
Clermont	509	78 75	70 35	570	105 75	79 00
Columbiana	565	103 25	103 25	650	60 00	60 00
Coshocton.....	49	77 35	44 55	23	25 65	14 15
Crawford.....	275	114 00	74 00	80	65 00	30 00
Cuyahoga	211	80 00	80 00	100	25 00	25 00
West Cuyahoga.....	609	142 50	61 75	340	42 20	27 75
Darke.....	382	561 75	460 87	152	33 50	27 90
Delaware.....	172	73 50	51 75	312	35 50	28 50
Erie.....	158	82 00	76 50	276	150 00	112 00
Fairfield						
Fayette						
Fulton	266	69 90	48 25	546	75 35	57 05
Geauga	417	77 50	60 50	574	37 75	33 25
Greene.....	532	106 25	101 75	187	50 00	41 00
Guernsey	250	250 00		225	60 00	
Hamilton	251	139 50	128 80	120	124 00	119 00
Hancock	132	95 00	61 00	80	45 00	22 50
Hardin	45	25 00	22 00	160	50 00	18 00
Harrison	138	15 00	5 00	300	25 00	10 00
Henry						
Highland	45	57 00	57 00	148	36 50	36 50
Holmes	24	102 25	6 25	6	26 60	9 00
Huron	35	51 50	18 00	37	43 00	15 50
Jefferson	395	82 15	61 10	214	28 65	21 60
Knox						
Lake.....						
Lawrence	102	32 00	21 95	161	86 00	38 50
Licking.....	450	261 50	189 00	268	140 00	114 00
Logan	439	70 95	103 25	57	27 00	17 25
Lorain		228 00	202 00		136 00	114 25
Lucas	688	347 50	286 50	589	250 00	198 20
Madison	246	204 50	153 50	230	109 50	78 00
Mahoning.....	429	225 70	131 95			
Marion.....	266	113 00	82 00			
Medina	140	59 40	58 40	247	10 75	21 00
Mercer.....	321	123 25	99 00	129	51 00	34 50
Miami	443	176 50	169 50	484	137 00	114 50
Monroe	141	30 00	17 00	187	28 00	10 20
Morgan	94	75 00	24 00	124	38 00	11 50

TABLE II—HORTICULTURE AND FLORICULTURE—Continued.

Counties.	Farm products.			Fruits.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Morrow.....	.....	\$110 00	\$90 00	700	\$60 00	\$41 00
Muskingum.....	300	183 00	130 87	309	260 50	174 50
Noble.....	15	45 00	13 00	15	18 00	13 50
Ottawa.....	84	151 00	18 13	82	77 00	26 87
Paulding.....	529	166 00	55 00	265	65 00	42 00
Perry.....	58	72 25	27 00	42	33 75	16 50
Portage.....	351	100 80	63 75	355	45 60	39 80
Preble.....	99	70 00	60 00	75	26 00	20 00
Putnam.....	800	150 00	147 00	400	40 00	38 00
Richland.....	277	181 50	152 00	176	69 50	52 50
Ross.....	66	108 00	69 00	75	126 00	101 00
Sandusky.....	386	85 00	66 00	290	40 00	34 00
Scioto.....	113	148 50	73 00	101	117 50	51 00
Shelby.....	299	76 25	.....	77	51 75	.....
Stark.....	.....	132 50	199 65	.....	240 00	136 25
Summit.....	958	175 25	344 50	815	79 50	154 00
Trumbull.....	461	83 00	63 00	367	50 25	36 25
Union.....	410	103 75	82 28	164	30 00	29 29
Van Wert.....	1,692	385 00	385 00	1,054	125 00	125 00
Vinton.....	.....	.....	.....	.....	.....	.....
Warren.....	458	89 75	87 25	254	67 50	66 00
Washington.....	23	226 10	6 50	36	34 55	13 25
Wayne.....	184	70 50	22 32	120	28 00	11 37
Wood.....	599	418 00	369 00	440	65 00	58 00
Wyandot.....	106	74 50	73 10	25	23 50	18 00
Totals..	21,412	\$9,333 80	\$6,789 22	16,925	\$4,712 60	\$3,339 18

p Includes flowers, pickles, etc.

TABLE II—HORTICULTURE AND FLORICULTURE—Continued.

Counties.	Flowers.			Pickles, canned fruits, jellies, etc.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams.....	32	\$27 00	\$21 00	325	\$35 00	\$33 00
Allen	23	31 75	30 75	322	53 50	46 50
Ashtabula	175	91 50	60 50	516	72 25	60 50
Athens.....	30	48 00	46 25	168	32 50	32 50
Auglaize	76	45 00	45 00	541	63 00	63 00
Belmont		20 00		78	25 00	16 65
Brown	180	70 00	53 00	125	35 00	33 00
Butler				594	69 00	68 00
Carroll	104	34 50	32 25	186	24 75	24 25
Champaign.....	18	41 00	28 00	434	71 75	68 00
Clark	235	256 00	167 45	342	124 00	66 50
Clermont.....	595	101 85	94 85	719	71 75	67 55
Columbiana.....	264	88 50	86 00	560	45 00	45 00
Coshocton	39	30 00	29 00	19	19 50	18 00
Crawford	25	85 00	26 00	140	30 75	30 00
Cuyahoga	79	42 00	42 00	113	14 00	13 75
West Cuyahoga.....	42	14 50	12 50	251	63 00	42 50
Darke	134	74 00	64 35	246	87 00	72 90
Delaware	62	73 50	52 00	258	39 75	37 50
Erie	104	77 25	69 25	145	44 50	38 50
Fairfield						
Fayette						
Fulton	94	45 55	19 70	273	41 70	31 25
Geauga	230	52 00	41 50	294	27 00	24 00
Greene	31	20 00	20 00	249	39 75	37 00
Guernsey	50	35 00		210	75 00	
Hamilton	28	111 00	111 00	202	56 00	42 20
Hancock				65	45 00	30 75
Hardin	72	45 00	35 00	100	25 00	24 00
Harrison	10			105	100 00	10 00
Highland	12	28 00	28 00	22	9 50	9 50
Holmes.....	11	19 50	3 50	59	30 35	13 15
Huron.....	10	33 50	28 50	77	23 00	19 00
Jefferson	163	40 55	28 84	726	73 20	51 68
Lake						
Lawrence	29	21 70	8 70	201	54 50	34 30
Licking	45	90 00	58 00	91	129 00	78 00
Logan	202	126 50	63 00	762	21 75	142 50
Lorain.....		36 50	28 00		35 00	32 00
Lucas				207	95 00	93 60
Madison	32	43 00	22 00	233	92 00	83 50
Mahoning	898	\$192 75	\$171 20			
Marion	805	235 00	150 00			
Medina	77	34 15	23 45	263	\$17 75	\$41 50
Mercer	119	52 75	38 50	36	40 00	39 00
Miami	125	53 00	41 50	378	65 50	64 50
Monroe.....						
Morgan.....	3	9 00	2 00	56	26 00	11 10
Morrow	40	60 00	40 00	925	60 00	50 00
Muskingum	5	50 00	24 00	51	13 00	13 00

TABLE II—HORTICULTURE AND FLORICULTURE—Concluded.

Counties.	Flowers.			Pickles, canned fruits, jellies, etc.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble	6	6 00	6 00	9	19 50	6 00
Ottawa.....		14 00			40 00	
Paulding	55	42 00	18 00	375	63 00	37 00
Perry.....	1	15 50	1 00	23	23 25	8 75
Portage	106	64 80	39 20	135	33 00	19 40
Preble	110	70 00	60 00	330	28 00	28 00
Putnam	25	20 00	20 00	400	48 00	45 00
Richland.....	18	23 00	16 00			
Ross	30	89 00	48 00	14	17 00	16 00
Sandusky.....	100	55 00	53 75	302	50 00	43 50
Scioto.....		26 00		21	51 75	13 00
Shelby.....	74	27 50		397	47 50	
Stark		165 00	109 50		144 00	129 00
Summit	171	180 50	148 00	255	56 60	39 00
Trumbull	165	87 25	71 25	78	24 00	23 25
Union.....	76	57 50	52 00	137	40 10	22 00
Van Wert	41	45 00	15 00	207	105 00	105 00
Vinton.....						
Warren	81	33 50	32 50	298	30 50	29 00
Washington	42	34 55	18 50	131	34 55	39 75
Wayne	32	32 00	11 62	118	30 00	13 80
Wood	80	60 00	53 00	612	48 00	43 00
Wyandot.....	47	33 00	33 00	187	77 50	23 50
Totals	6,568	\$3,866 90	\$2,752 86	15,696	\$3,227 25	\$2,537 08

TABLE II—FINE ARTS, ETC.

Counties.	Fine arts.			Textile fabrics.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	53	\$29 50	\$23 75	596	\$198 75	\$116 00
Allen	165	77 60	69 75	361	213 75	113 75
Ashtabula	195	116 50	102 50	876	198 25	186 00
Athens	44	39 00	26 00	76	48 00	28 00
Auglaize	260	100 00	100 00	587	100 00	100 00
Belmont	1	33 00	1 00	27	34 00	9 75
Brown	15	12 00	12 00	210	90 00	70 00
Butler	443	155 00	151 00	1,336	303 75	297 50
Carroll	27	17 00	12 00	334	75 25	69 50
Champaign	166	72 00	61 00	410	128 00	108 25
Clark	193	227 25	78 00	240	308 75	145 25
Clermont	103	52 00	51 00	681	145 00	137 00
Columbiana	20	21 00	18 00	210	80 50	78 25
Coshocton	116	135 75	66 25	134	80 50	62 75
Crawford	36	111 00	30 00	350	200 00	110 00
Cuyahoga	146	38 50	38 00	339	125 00	125 00
West Cuyahoga	39	19 25	13 00	641	44 45	44 45
Darke	178	114 00	94 95	786	302 00	288 90
Delaware	97	62 00	56 00	347	142 75	135 25
Erie	236	181 50	73 00	563	290 35	146 65
Fairfield						
Fayette						
Fulton	124	110 00	79 00	342	169 65	99 40
Geauga	76	47 00	40 00	378	99 00	75 00
Greene	383	197 00	154 00	94	109 00	85 00
Guernsey	20	40 00		281	275 00	
Hamilton	276	138 00	137 00	512	141 75	141 00
Hancock	92	249 50	110 25	240	180 00	84 75
Hardin	188	100 00	74 00	20	35 00	18 00
Harrison	16	50 00		95	100 00	10 25
Highland	23	13 00	13 00	70	29 00	29 00
Holmes	8	53 00	3 50	63	80 70	21 30
Huron	7	28 00	4 00	113	70 25	30 25
Jefferson	94	42 65	20 20	320	110 40	63 32
Lake						
Lawrence	16	32 75	12 25	121	47 00	28 25
Licking	114	173 00	126 00	540	508 00	390 29
Logan	253	284 50	73 00	832	321 75	254 10
Lorain		220 00	201 20		165 00	135 50
Lucas	313	400 00	175 92	25	56 00	54 00
Madison	37	72 50	41 00	224	162 60	91 25
Mahoning	101	195 50	82 25	199	76 20	37 75
Marion	140	191 00	160 00	796	246 00	169 00
Medina	44	73 10	30 65	293	100 70	124 55
Mercer	133	125 80	67 35	389	229 55	160 35
Miami	160	218 00	172 50	901	335 50	308 50
Monroe	7	50 00	24 75	68	25 00	9 35
Morgan	42	28 00	7 20	27	39 00	10 50
Morrow	160	100 00	90 00	1,250	180 00	165 00
Muskingum	63	180 00	99 75	89	61 50	58 37

TABLE II—FINE ARTS, ETC.—Concluded.

Counties.	Fine arts.			Textile fabrics.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Noble				26	41 25	18 00
Ottawa	8	27 50	3 75	22	74 00	7 00
Paulding	165	56 00	25 60	342	124 00	65 00
Perry	1	23 25	75	6	44 00	3 50
Portage	21	47 75	16 00	212	68 90	57 50
Preble	113	68 00	60 00			
Putnam	225	240 00	225 00	946	186 00	130 00
Richland	48	62 00	29 50	283	109 50	89 00
Ross	45	124 00	81 00	176	320 00	285 00
Sandusky	175	93 00	60 25	547	210 00	145 00
Scioto		45 00		48	107 00	22 60
Shelby				263	101 25	
Stark		196 00	121 00		285 00	227 75
Summit	238	154 50	130 25	406	162 00	80 00
Trumbull	140	63 50	49 00	428	117 75	93 50
Union	76	60 90	54 00	337	124 95	97 50
Van Wert	148	85 00	85 00	754	350 00	350 00
Vinton						
Warren	79	72 00	59 50	628	218 75	164 75
Washington	32	109 85	24 74	76	109 85	32 40
Wayne	37	51 75	12 50	347	200 00	78 52
Wood	640	160 00	134 00	2,436	200 00	181 00
Wyandot	43	23 75	17 25	253	101 25	70 00
Totals	7,657	\$6,690 80	\$4,268 07	25,922	\$10,263 05	\$7,223 70

TABLE II—NON-ENUMERATED.

Counties.	Non-enumerated.		
	No. of entries.	Amount offered.	Amount awarded.
Adams.....			
Allen.....			
Ashtabula.....	484	\$512 40	\$412 40
Athens.....	89	50 00	10 30
Auglaize.....			
Belmont.....	18	47 00	12 50
Brown.....			48 50
Butler.....	22	23 00	16 00
Carroll.....	283		
Champaign.....			
Clark.....			
Clermont.....	4	55 00	55 00
Columbiana.....			
Coshocton.....	881	122 45	122 45
Crawford.....	5		36 89
Cuyahoga.....	141	115 00	72 00
West Cuyahoga.....			
Darke.....			
Delaware.....			
Erie.....	37		
Fairfield.....			
Fayette.....			
Fulton.....	355	113 40	76 40
Geauga.....			
Greene.....			
Guernsey.....	12	150 00	
Hamilton.....		350 00	350 00
Hancock.....			
Hardin.....	2	5 00	2 00
Harrison.....	40	20 00	
Highland.....	20	8 00	8 00
Hocking.....			
Holmes.....			
Huron.....			
Jefferson.....	86		5 06
Lake.....			
Lawrence.....			
Licking.....			
Logan.....	26		10 00
Lorian.....		24 00	15 66
Lucas.....			
Madison.....			
Mahoning.....			
Marion.....			
Medina.....	236	15 50	21 60
Mercer.....			
Miami.....	109	630 50	55 50
Monroe.....	50		3 15
Morgan.....	21	85 00	11 00
Morrow.....	225	150 00	101 75

TABLE II—NON-ENUMERATED—Concluded.

Counties.	Non-enumerated.		
	No. of entries.	Amount offered.	Amount awarded.
Muskingum	9	39 50	5 25
Noble	76	75 00	58 50
Ottawa		10 00	
Paulding	125	65 00	15 00
Perry			
Portage	33	75 25	34 50
Preble	362	300 00	250 00
Putnam	75	57 00	51 00
Richland		128 00	30 00
Ross			
Sandusky			
Scioto			
Shelby	87	93 25	
Stark			21 50
Summit	86	30 50	21 00
Trumbull			
Union			
Van Wert	148	30 00	30 00
Vinton			
Warren	27	100 00	90 75
Washington	9	120 00	3 30
Wayne	21	20 00	1 50
Wood	84	34 00	26 00
Wyandot			
Totals	4,288	\$3,653 75	\$2,084 46

TABLE III—RECEIPTS, DISBURSEMENTS, ETC., OF COUNTY AGRICULTURAL SOCIETIES IN 1896.

Counties.	Amount received from gate admissions.	Amount received from entry fees.	Amount received from booth rents and privilege permits.	Amount received from other resources.	Amount paid in premiums.	Amount paid for real estate, buildings and improvements.	Amount paid for current expenses other than premiums.
Adams.....	\$1,292 30	\$78 40	\$156 61	\$761 26	\$1,135 00	\$235 15	\$918 42
Allen.....	1,917 25	313 90	433 50	225 48	1,150 18	252 04	1,397 03
Ashtabula.....	2,047 10	887 50	479 16	411 25	3,417 20		1,060 41
Athens.....	2,123 00	204 30	215 00	672 00	2,322 00		2,513 38
Auglaize.....	2,229 85	215 25	735 00	439 90	2,322 00		1,192 46
Belmont.....	687 30	133 20	51 00	601 60	523 20	448 84	501 76
Brown.....	1,197 25	79 40	406 40	564 61	1,545 85		1,203 67
Butler.....	5,201 75	860 25	1,806 30	856 00	5,437 50	100 00	2,618 21
Carroll.....	1,118 00	531 30	262 30	870 65	1,683 86		858 31
Champaign.....	3,148 82	1,376 70	677 00	1,533 23	4,163 00	840 34	1,263 53
Clark.....	2,154 97	1,707 45	1,253 25	1,206 49	4,650 20		2,251 96
Clermont.....	2,184 46	187 55	460 00	487 49	2,088 00		1,180 36
Columbiana.....	1,736 75	292 80	466 00	1,176 25	1,664 25	200 00	2,250 25
Coshocton.....	4,182 70	808 37	691 50	122 05	4,062 15		1,844 05
Crawford.....	1,172 75	183 50	276 50	999 29	1,421 39		707 85
Cuyahoga.....	1,640 70	232 70	259 00	3,746 96	1,561 25	489 42	778 36
West Cuyahoga.....	1,106 15	363 10	389 50	1,105 68	1,539 02	3,789 75	789 29
Darke.....	5,220 70	1,153 00	1,319 55	1,456 80	5,358 47	27 30	3,680 22
Delaware.....	965 25	277 75	288 70	67 30	640 00		958 00
Erie.....	1,910 85	706 80	162 55	1,532 14	1,963 06	86 42	1,325 57
Fulton.....	2,071 95	180 80	568 25	918 63	1,025 45	625 46	1,065 47
Geauga.....	2,382 00	426 00	331 00	407 00	2,477 00		1,186 00
Greene.....	2,153 94	899 45	753 30	890 60	3,125 55		1,247 98
Guernsey.....	53 70	15 25	10 00	1,177 10	15 25	845 42	377 65
Hamilton.....	5,750 50	1,295 00	2,319 85	1,791 60	5,191 00	539 29	5,368 93
Hancock.....	2,041 50	190 10	641 15	440 65	1,488 25	485 00	2,040 15
Hardin.....	1,141 13	392 56	347 50	402 86	1,100 00	375 00	809 05
Harrison.....	643 40	65 00	47 00	217 90	520 12		685 40
Highland.....	931 90	317 50	150 00	398 25	1,384 00		413 60
Holmes.....	470 00	107 00	119 00	1,167 00	121 00		1,762 00
Huron.....	724 51	65 00	50 85	340 00	293 25	437 06	886 88
Jefferson.....	968 29	379 55	200 00	403 49	1,435 18		250 00
Lawrence.....	199 55	142 71	13 20	142 70	323 60		156 48
Licking.....	4,083 90	1,089 00	1,018 18	8,462 38	4,892 39	7 637 46	2,056 48
Logan.....	2,064 74	576 00	672 64	124 29	1,687 57	150 00	1,617 93
Madison.....	2,476 29	345 00	560 00	450 00	2,396 56		2,887 07
Lucas.....	3,678 45	1,230 55	2,975 86		6,711 55	580 13	2,070 05

TABLE III.—RECEIPTS AND DISBURSEMENTS, ETC.—Concluded.

Counties.	Amount received from gate admissions.	Amount received from entry fees.	Amount received from booth rents and privilege permits.	Amount received from other sources.	Amount paid in premiums.	Amount paid for real estate, building and permanent improvements.	Amount paid for current expenses other than premiums.
Madison	\$2,313 10	\$1,553 37	\$495 50	\$353 02	\$3,051 95	\$2,218 31	\$1,645 25
Manitowish	1,907 25	604 00	410 25	4,878 74	3,226 97	100 00	2,675 48
Marion	1,000 00	1,000 00	350 00	250 00	2,522 00	448 55	1,115 00
Medina	1,854 50	353 50	462 50	23 29	2,972 51	2,049 11	1,679 15
Merced	2,838 50	449 00	1,615 19	1,796 32	3,765 50	1,098 64	1,679 15
Miami	2,427 65	914 70	514 25	1,893 96	3,765 50	1,098 64	1,679 15
Monroe	1,529 59	329 10	128 50	523 33	1,168 25	1,098 64	1,679 15
Morgan	650 63	119 61	116 00	1,615 43	737 90	220 52	794 38
Morrow	2,122 00	1,069 35	354 00	1,442 76	2,909 75	528 39	1,550 07
Muskegon	2,824 30	1,432 67	672 06	2,798 48	3,858 99	847 39	3,019 66
Noble	423 20	196 88	73 00	97 92	542 50	372 62	200 00
Ottawa	161 75	150 00	148 49	5 00	379 00	250 00	139 32
Paidung	1,550 35	301 00	530 90	422 07	1,804 45	250 00	730 46
Perry	841 00	770 75	176 00	239 89	1,695 25	50 00	870 32
Portage	1,394 75	256 01	345 35	2,589 99	1,741 08	687 00	2,777 71
Preble	2,643 75	183 00	578 33	2,110 34	2,340 00	187 00	2,000 00
Putnam	2,825 00	1,204 45	1,370 89	2,101 88	4,671 00	167 79	2,679 73
Richland	710 47	982 20	139 20	412 57	1,457 45	52 49	916 39
Ross	2,881 65	1,640 44	1,083 50	1,000 00	4,333 00	250 00	2,349 54
Sandusky	2,053 60	163 15	608 50	42 00	2,557 00	250 00	1,250 25
Scioto	1,435 20	987 60	715 85	372 34	2,356 00	250 00	1,154 93
Shelby	1,480 72	531 00	247 85	190 95	1,250 00	250 00	1,197 00
Stark	1,788 55	919 95	482 25	254 00	4,256 08	440 79	4,226 65
Summit	2,441 85	773 73	527 85	2,868 51	3,612 85	302 20	4,714 41
Trumbull	2,582 80	554 25	1,067 95	400 00	2,663 50	237 44	1,648 74
Tuscarawas	23 00	.....	747 34	540 00	1,455 50	1,267 98	990 91
Union	1,963 15	435 35	251 17	.....	4,088 77	115 67	2,549 38
Van Wert	4,292 36	287 00	1,312 30	942 29	2,593 25	88 29	2,649 99
Warren	2,540 71	262 14	531 25	247 68	1,097 29	70 56	1,046 39
Washington	1,798 45	206 25	985 13	420 00	3,767 00	1,557 00	1,210 40
Wayne	1,078 81	648 82	122 00	636 76	485 48	.....	1,191 45
Wood	3,076 00	980 00	1,297 00	1,323 40	.....	.....	.....
Wyandot	1,110 25	145 90	285 80	135 35	.....	.....	.....
Totals	\$15,178 14	\$38,344 87	\$40,302 95	\$68,529 13	\$156,170 07	\$ 32,562 57	\$107,475 91

PROCEEDINGS
OF THE
FIFTY-SECOND ANNUAL
Ohio State Agricultural Convention

SENATE CHAMBER,
COLUMBUS, OHIO, JANUARY 14, 1897.

The Convention was called to order at ten o'clock A. M. by the President, Mr. J. C. Bower, and prayer was offered by Rev. C. L. Winget, of Columbus.

PRAYER.

Our Father who art in heaven, we come to Thee this morning in humility of spirit and gladness of soul. Oh, God, Thou art wonderfully gracious unto us, yet we are often forgetful of Thee and of Thy love, of our helplessness, of our dependence upon Thee. We move on as though there were no God to whom we should render account, and yet in all our wilfulness, our sinfulness, our forgetfulness Thou hast not cut us off. We praise Thee, our Father that amid all the affairs of this life, with cares and duties and obligations resting upon us, that Thou art still willing to help us, to direct us so that our life in all particulars and in all lines shall be a success, shall be for the honor and glory of God, for the upbuilding of our own character and well-being.

We have assembled here this morning, Holy Father, with those who represent the great interests of husbandry, those who are workers together with Thee in preparing bread for the multitudes. Thou hast given the beautiful land as our heritage; Thou art adequately supplying the sunshine and the shower. and bringing about the seasons in regular order, so that if we are willing to abide the time of our God in these things, if we are willing to plow and plant and sow, God will give the increase. So, our Father, in these things we rejoice to know that we are workers together with Thee. Oh, God, bless these men who have gathered here to deliberate upon the measures and means best calculated to advance the interests of husbandry in all its special lines, in all its particular duties and work. Grant to them great

wisdom and help in their conclusions, that they shall be wise conclusions; and as they go out from here may they be profited by this association so that when they return to their fields of labor they may work intelligently. We may go with industry, we may go with a will, we may go with a purpose, but if we lack intelligence in these things we must suffer loss. God help the farmers of this land to have an intelligent grasp of their duty and the broad sphere to which they are called, and as they labor may they labor on in the fear of God. Our Father, we do thank Thee for this beautiful land; we do thank Thee for this heritage. We do pray, our Father, Thy blessing upon the heads of those in authority, upon the President of the United States and his officers; upon the chief executive of this great commonwealth and those who are gathered to him to aid in the arduous work of administering the affairs of state. Remember those who hold subordinate places in all positions. May our beautiful Ohio be grand and great because illuminated by truth, and right, and virtue, and honor. Bless us from day to day that when the battles of life are over and we have finished our course, we may receive the "Well done" from our Father who art in heaven, and to Thy name shall be glory and honor and praise, world without end. Amen.

The President announced that the Secretary would call the roll of county societies and the presidents or accredited delegates would come forward with their reports, which was done.

President Bower: Gentlemen of the Convention, Governor Bushnell has been invited to appear before you and deliver an address of welcome. I therefore appoint Mr. Charles H. Ganson, of Champaign county and Mr. Albert Hale, of Summit county, a committee to wait upon the Governor and inform him that this convention has convened, and if he can be present, escort him to the chamber.

And thereupon the committee retired to wait upon the Governor, but as he was out of the city, Col. J. L. Rodgers, the Governor's private secretary appeared and was introduced by the president and said:

Mr. Chairman and Gentlemen of the Convention: My presence here to-day is probably self-explanatory. As many of you have heard, the Governor is detained at home on account of illness and therefore it will not be his privilege to address the convention to-day. I was in communication with him this morning, and he wanted me to assure you all that he would have esteemed it one of the greatest pleasures of the year to have been enabled again to address the convention as he did last year. The Governor, I know, feels a deep interest in all agricultural matters. The best years of his life, as many of you know, have been spent in work that has brought him in very close contact with the agriculturists of the country. I know the pleasure he took in witnessing the state fair last fall, and he told me at that time, that of all things that entered into his official life none had pleased him more than his visit to the state fair, which brought to his mind the realization of the honor and dignity of being the chief executive of a state which could produce such an agricultural display.

He wanted me to tell you, gentlemen, that it would afford him the greatest pleasure to be able to contribute to your well-being in any way,

and he also desired me to say that if there is anything the executive office can do for the convention, or any of the tributary bodies, that it will give him the greatest pleasure to have his assistants attend to it. The welcome that the Governor extends I assure you is as hearty as possible. I only regret that he is not here to do it himself, and that he could not meet you all personally in his office. Gentlemen, I thank you for your attention.

ADDRESS BY J. C. BOWER, PRESIDENT STATE BOARD OF AGRICULTURE.

Gentlemen of the Convention:

It is my privilege, as presiding officer of the State Board of Agriculture, to welcome you to-day to the fifty-second State Agricultural Convention, and it is my pleasurable duty to give you a brief summary of the work of the Board during the year 1896.

The year just ended has been one of unparalleled financial depression. Business has been almost paralyzed. Stagnation has threatened every enterprise. Agriculturists have borne a very heavy burden; they have toiled early and late, but the elements combined to destroy a large portion of the fruits of their labor, and after the crops were harvested they could not be sold for enough to pay the actual cost of planting and harvesting. So farmers as a rule, in balancing their accounts for the past year, find the balance on the debtor side. But let us hope that the year upon which we are just entering has better things in store for us; that the advance in the price in wheat is but an indication of a general improvement in the price of farm products generally; that the sheep industry of the state may receive a new impetus by wise legislation; let us hope that a growing confidence in our future prosperity will enable us to throw off the discouragement and fear and despondency which have enveloped us like a pall for some years, and that it will infuse new courage and hope and faith into our hearts.

The Ohio State Fair and Industrial Exposition of 1896 was superior in point of excellence to any of its predecessors. The exhibits were very much greater in number than at any previous fair in the history of the Board, and the class of exhibits was equal, if not superior, to previous fairs; but because of continuous rain on Thursday the attendance was greatly reduced, and on account of this fact alone it was not a financial success.

The Board was therefore obliged to borrow the sum of ten thousand dollars (\$10,000.00) to enable it to pay in full all liabilities incurred, because of absolutely necessary repairs of the buildings and improvements to the grounds and a large premium list. The Board found no difficulty in securing a temporary loan to cover the amount of the deficit caused by reduced receipts from the fair, and it is carrying this with the hope of being able to liquidate it in the near future, if favorable conditions prevail—that is, general prosperity among the agricultural classes and good weather during fairs.

During the past year many improvements were made to the permanent buildings on the fair grounds. These were made necessary by reason of original faulty construction, decaying timbers, damage by the elements, etc. It affords me much pleasure to be able to report at this time that, while the general appearance of these buildings has not been materially improved externally, their foundations have all been rebuilt, raised, supported and protected by iron columns, new timbers and iron braces, so that the buildings are now absolutely safe and will remain so for many years to come. Exterior repairs can be made as soon as the finances of the Board will permit.

One of the permanent improvements which the Board felt in duty bound to make was the erection of a memorial building over the Grant cottage, which was donated to the Board by Mr. H. T. Chittenden of this city, in 1888. The cottage was removed from an obscure location on the fair grounds to the most conspicuous point, just west of the Exposition buildings, and there was erected over it a handsome memorial structure, monumental in design, of iron and glass, at a cost of four thousand dollars (\$4,000), in round numbers. The Board felt the necessity of erecting this memorial building as a protection to the cottage, because of its historic value as being the birthplace of Gen. Ulysses S. Grant, the greatest general this country has ever produced, and because it was accepted as a gift from Mr. Chittenden. The building is artistic as well as permanent, and it will always be a credit to the Board and should be of interest to not only every resident of Ohio, but to every citizen of the United States. There has been much favorable comment in regard to it by metropolitan journals, magazines, etc., which has been very gratifying to the Board. It is a very attractive building and a worthy memorial of one who will be more and more beloved by his countrymen as the years go by, for

"The brave
Die never. Being deathless, they but change
Their country's arms for more—their country's heart."

Except the shortage occasioned by the rainy weather that prevailed during the fair, the financial condition of the Board is all that could be desired.

For a statement of receipts and expenditures of the Board during the year, I would refer you to the report of the Treasurer, which will be submitted at this meeting.

That the annual fairs are beneficial to the general interests of agriculture is not, I believe, questioned by any one. The coming together of representative farmers and their families from all parts of the State, and noting the improvements made in stock, agricultural implements and machinery adapted to farming purposes, manufactures, etc., has a broadening influence and tends to bring about a recognition of the dignity of agricultural pursuits.

I believe that such arrangements should be made as will enable the Board to protect the property in its care, but which is owned by the State, in the matter of painting and roofing the large number of buildings on the fair grounds, and which the Board has not been able to do heretofore because of a lack of funds.

The licensing, inspection and analysis of commercial fertilizers is a very important work, and by statute is placed in the hands of the Secretary of the State Board of Agriculture. The Ohio fertilizer law was enacted in 1881, and the following table shows the increase of the fertilizer business in this State from that date until the close of the year 1896:

In 1882 there were licensed	106 brands.
1883 " " 	97 "
1884 " " 	115 "
1885 " " 	133 "
1886 " " 	156 "
1887 " " 	151 "
1888 " " 	183 "
1889 " " 	247 "
1890 " " 	290 "
1891 " " 	295 "
1892 " " 	339 "
1893 " " 	371 "
1894 " " 	420 "
1895 " " 	495 "
1896 " " 	522 "

At the present time all samples of commercial fertilizers for analysis are drawn on the open market or taken from goods in the hands of consumers. Samples sent in by manufacturers are analyzed for comparison with other samples, but not for publication in the Fertilizer Report, nor are samples drawn at factories or general agencies for analysis. The results of this plan have proved very satisfactory to the Board, and it is believed to be the fairest method of doing the work prescribed by the statutes of the State.

A very important work of your Board is the holding of farmers' institutes in the various counties of the State, under its auspices and direction. The work began by holding a few scattered institutes over the State, and it has gradually increased until this year the number will probably reach three hundred regulars and independents. The farmers' institute law was amended by the General Assembly last April, and the statute now provides an allowance of three mills per capita to the State Board of Agriculture. This slight increase of one mill has enabled the Board to enlarge its work very materially this season, and plans are being perfected and preliminary work is being done with a view to increasing the number next year.

One-half of the institute meetings for 1896-7 have been held and the reports from these show a great and increasing interest. The results are certainly very gratifying to the Board, and there is no doubt but the good work will go on. A large number of independent farmers' institutes have already been held, and many more societies have signified their intention of holding independent meetings this season. That there is plenty of talent in the ranks of the agriculturists is shown by the large number of excellent papers published in our Annual Institute Reports.

The value of the monthly crop reports issued by the State Board of Agriculture is being recognized. It is only through this channel that the farmers of the State can obtain information on the crop and live stock conditions to be of service to them. The grain and stock speculators are not dependent on our reports for their information; they have experts in the field continually who make regular reports, and the information thus gained would be used to the disadvantage of the farmers were they not made familiar with existing conditions through the reports issued by the Board. These reports are compilations of individual reports furnished by a corps of fifteen hundred observers who perform this labor because of their interest in it. The Board is, and farmers generally should be, under special obligations to this unpaid, voluntary contributors to the good of agriculture.

The work of the Board has been harmonious in all respects, and all members, officers and employees have performed their respective duties with an eye single to the interests they are expected to conserve.

As the resident member of the Board, I am able, from personal knowledge, to speak in reference to the work performed in the office. Mr. W. W. Miller, in his two years of service as Secretary of the State Board of Agriculture has demonstrated his rare executive ability. He has made an efficient secretary, carrying on the work of the Board with intelligence and vigor. His labors have been arduous and often trying, but he has served the Board faithfully and has conducted its business with the same care and fidelity that he would give to private interests. His judgment in all matters pertaining to the fair grounds and exposition buildings is exceptionally good, and to him belongs a large part of the credit for the permanent improvements that have been made during the past two years. His efficiency in managing the fertilizer business and enforcing the fertilizer law is shown by the large increase in fertilizer receipts during a period of great financial depression. The amendment of the institute law by which the number of institutes has been greatly increased, was secured largely by his efforts.

The ability of Mr. Fleming, the Assistant Secretary, is so well known that it is hardly necessary for me to refer to it. He is one of the best informed men on fair

matters in the country, and his many years of experience in connection with the Ohio State Fair has made him invaluable to the State Board of Agriculture.

The Board wishes me in this public way to acknowledge courtesies received at the hands of the General Assembly of the State, which has always shown a willingness to render necessary and reasonable aid to the State Board of Agriculture.

In closing, I wish to acknowledge the uniform courtesy and generous support accorded me at all times in the discharge of my official duties by my associates, the officers and members of the Board.

The President: We will now hear the report of the Treasurer.

The Treasurer: Gentlemen of the Convention, I will now read to you the annual statement showing the financial transactions of the Ohio State Board of Agriculture ending December 1, 1896.

ANNUAL STATEMENT,

SHOWING THE FINANCIAL TRANSACTIONS OF THE OHIO STATE BOARD OF AGRICULTURE FOR THE FISCAL YEAR ENDING DECEMBER 1, 1896.

The following statement is a summarized exhibit of the financial transactions of the Ohio State Board of Agriculture for the fiscal year, 1896, with a showing of its general financial condition, as set forth in the several itemized journal and ledger accounts.

Receipts are charged to the Treasurer and the respective state appropriation funds, and all disbursements have been made by checks or orders signed by the President and Secretary.

The statement sets forth the cash balances in the several funds at the close of last year, and the balances remaining at the close of the present year, and is a complete summarized showing of the financial condition of the Board, December 1, 1896.

Respectfully submitted,

A. J. CLARK,
Treasurer.

RECEIPTS.

FROM STATE APPROPRIATIONS, CHARGED TO APPROPRIATION ACCOUNTS, AS FOLLOWS:

BALANCES FROM LAST YEAR.

In fund for encouragement of agriculture.....	\$1,358 73
In fund for contingent expenses.....	169 89
In fund for weather and crop service.....	136 43
In fund for payment of bonds and interest.....	900 00

APPROPRIATIONS FOR 1896 AND THE FIRST QUARTER OF 1897.

For encouragement of agriculture.....	6,500 00
For contingent expenses	1,200 00
For weather and crop service.....	1,800 00
For payment of bonds and interest.....	13,000 00
For furniture and repairs.....	400 00

Total from state appropriations.. \$25,465 05

FROM MISCELLANEOUS SOURCES, CHARGED TO THE TREASURER.

Balance in hands of treasurer at close of last year.....	\$948 28	
From farmers' institutes—per capita collections.....	5,375 75	
From fertilizer licenses.....	10,655 00	
From borrowed on the Boards' note of July 22, to the Hayden National bank.....	5,000 00	
From sale of hay.....	157 19	
From stall rents.....	82 50	
From returned premium on canceled insurance	22 60	
From Columbus Hotel Keepers' Association, settlement of electric light subscription of 1895	145 00	
From rent of house on grounds.....	35 00	
From Ohio Farmer, for expense of stenographic report of annual meetings.....	14 50	
From sale of old material, weather bureau instruments and old dictionary.....	114 25	
From American Trotting Association, collections on old suspensions.....	4 90	
From borrowed on the Board's note of September 12, to the Hayden National bank.....	10,000 00	
Total miscellaneous.....		\$32,596 97

PROCEEDS OF STATE FAIR.

From sale of full admission tickets.....	\$12,801 00	
From sale of children's half tickets.....	278 75	
From sale of special tickets	191 00	
From sale of grand stand tickets.....	1,135 25	
From sale of exhibitors' and wagon tickets.....	613 30	
From entrance fees, class	1,278 42	
From entrance fees, speed.....	2,677 50	
From sale of privileges.....	3,473 25	
From woman's department.....	22 00	
From surplus advertising expense fund.....	10 73	
From American Trotting Association, collections and settlements of suspensions, present year.....	50 00	
Total state fair		\$22,531 20
Grand total receipts from all sources.....		\$80,593 22

DISBURSEMENTS.

FOR GENERAL ACCOUNTS.

For old outstanding checks redeemed.....	\$ 40 00
For expense of members.....	581 15
For express and freight.....	458 49
For fair ground improvements.....	9,193 02
For farmers' institute expense.....	5,131 09
For fertilizer inspection and analysis.....	3,757 76
For general printing.....	23 75
For general labor and assistance.....	58 05

For general supplies.....	\$718 90
For interest on notes and temporary loans.....	69 99
For note redemption.....	8,262 50
For office expense.....	1,379 44
For salary superintendent of fair grounds.....	450 00
For postage and telegraph.....	867 44
For bond redemption.....	5,000 00
For interest on bonds.....	1,800 00
For salary of secretary.....	2,500 00
For salary of assistant secretary.....	2,100 00
For salary of stenographic clerk.....	900 00
For salary of messenger clerk.....	682 50
For weather and crop service.....	1,626 13
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Total miscellaneous.....	\$45,560 21

STATE FAIR ACCOUNTS.

For expense of horse department.....	\$281 00
" cattle ".....	82 05
" sheep ".....	65 80
" swine and poultry department.....	198 10
" machinery and agricultural implements.....	487 18
" farm products, fruit, etc.....	206 55
" mechanics and manufacturers' department..	84 50
" woman's department.....	639 37
" secretary's ".....	264 00
" treasurer's ".....	427 00
For meals.....	360 08
For premiums.....	14,775 25
For refund entrance and tickets.....	190 88
For state fair printing and advertising.....	3,485 90
For state fair labor and assistance.....	2,137 40
For state fair material and supplies.....	1,203 86
For state fair expense of members.....	596 07
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Total state fair accounts.....	25,484 99

Total disbursements on all accounts as shown by checks and orders issued.....	\$71,085 20
From which deduct the outstanding unpaid checks of present year.....	99 60
And there is shown actual disbursements from all funds.....	70,985 60
Deducting the actual disbursements from the total receipts from all sources, and there is shown a balance cash on hand—all funds.....	9,607 62
This balance consists of cash in hands of treasurer at the Hayden National bank.....	630 69
In state appropriations for encouragement of agriculture.....	1,514 20
Contingent expenses.....	52 43
Weather and crop service.....	310 30
Payment of bonds and interest.....	7,100 00
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Total as above.....	9,607 62

LIABILITIES.

The liabilities of the Board are for first mortgage bonds,		
outstanding.....	\$25,000	00
Notes or bills payable.....	10,000	00
Outstanding unpaid checks of present and former years.....	448	80
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Total.....	\$35,448	80

PROPERTY VALUE.

State fair grounds, buildings and improvements, figured at		
cost, up to the close of last year.....	\$286,798	17
Cost of improvements made during 1896.....	9,193	02
<hr/>		
Total cost value.....	\$295,991	19
The cost value of property being in excess of liabilities.....		
	260,542	39

The report of the auditing committee was read by Capt. E. C. Ellis, as follows :

REPORT OF AUDITING COMMITTEE.

Ohio State Board of Agriculture:

GENTLEMEN: The undersigned committee, appointed to examine and audit the books and accounts, beg leave to report that we have had before us all the books, vouchers, checks and orders, connected with the financial transactions and have given the same our careful attention, by examining each entry in the journal and comparing the vouchers and checks corresponding. We find the entries, vouchers, checks and orders to be correct and properly authorized, and the several accounts intelligently analyzed and plainly set forth in the ledger accounts.

The receipts from the several sources and the disbursements on the several accounts, together with balances as shown in the accounts and summarized in the annual statement, we find to be correct.

The receipts from all sources, including state appropriations, have been \$80,593.22, and the total disbursed for all purposes and from all funds, \$70,985.60, leaving a balance of \$9,607.62.

Of this balance only the sum of \$630.69 is in the hands of the treasurer for general expense, the balance of the sum remains in the several state appropriations made for specific purposes, and can be expended only for the purposes appropriated.

The receipts of the last state fair, included in the grand total, amounted to \$22,531.20, while the amount expended for current expenses of the fair was \$25,484.99, showing an expenditure for the fair above the fair receipts of \$2,953.79.

There was expended in the erection of the Grant memorial building and in improvements to the fair grounds and buildings, the sum of \$9,193.02.

These permanent improvements, contracted prior to the fair, with the deficiency in fair receipts as stated, occasioned by rain on Thursday, the important day of the fair, necessitated a loan of \$10,000.00, which is shown in the accounts and set forth in the statement among the liabilities.

The books and accounts as kept by the assistant secretary are commendable for their correctness, simplicity and neatness, while the annual statement re-

corded at the close of the journal is a complete summary of the financial transactions for the year and correctly shows the general financial condition of the Board.

Respectfully submitted,

E. C. ELLIS,
C. BORDWELL,
G. LIGGETT,
Auditing Committee.

The President : The next thing in order will be the appointment of the necessary committees. I will appoint as the committee on credentials, A. H. Kling, of Marion county, V. D. Craig, of Guernsey, and George W. Carey, of Warren county; and as the committee on resolutions, F. A. Derthick, of Portage county, J. T. Robinson, Seneca county, and E. W. Porter, of Union county. Delegates having resolutions to submit will please present them to the committee on resolutions.

After some announcements were made by the Secretary the President announced that the next thing in order would be the nomination of candidates for membership on the State Board of Agriculture, five of whom were to be chosen.

Mr. C. H. Ganson, Champaign : I have not a speech to make, but I want to place in nomination a gentleman who will need no eulogy, in fact, I would say I do not believe that any of the members of the Board need any eulogy. The old members have been the right men in the right places, and I want to say to them one and all that I believe they have performed their duties honestly and faithfully, working for the interest of agriculture and to the interest of the Ohio State Fair. The gentleman whose name I present to you, you are well acquainted with and know of his past and present circumstances. He is your worthy Treasurer. I will place in nomination A. J. Clark of Guernsey county.

Mr. William F. Burdell, Franklin : I desire to place in nomination for a place upon the State Board of Agriculture, a gentleman who was formerly a member of the Athens county agricultural society, and served one term as member of the State Board from that county, and afterwards came to Columbus, and served one term upon the Board from Franklin county, and for one year he has served as your President. I believe that all of you gentlemen are familiar with the close and intimate relation that must necessarily exist between your State Board, particularly your fair association, and the city of Columbus. You must appreciate the fact that it is almost necessary to have a resident member, a man in close touch with your property interests here, a man who for three hundred and sixty-five days is on the ground. Gentlemen, I have the pleasure and the honor of presenting on behalf of Franklin county, Captain J. C. Bower.

Mr. J. O. Rapp : I have the pleasure of nominating Mr. Chester Bordwell, of Clermont county. I know him to be a gentleman of high standing and a good business man, and I am sure that he is thoroughly equipped for any position that he may be called to in the State Board of Agriculture.

Mr. D. Ullery: I want to present the name of a gentleman from Morrow county to the State Board of Agriculture, who is peculiarly and well fitted to perform the duties of a position upon the State Board of Agriculture. He is a man who has made the business of agriculture, from early childhood up to the present time, his work and his ambition, and I venture to say that there is not a man in Morrow county who does not know John H. Pringle as a successful agriculturist. For sixteen years he has served faithfully and well as a member of the Morrow county agricultural society, and no man, during all that time, has had cause to complain, or complained of ill or impartial treatment at the hands of John H. Pringle. For two years he was member of the Ohio State Board of Agriculture, and, I am informed, it was on account of the location of his county that he was dropped from that place which he now asks again. Gentlemen, John H. Pringle has been chosen by the various agricultural societies of the state every year to serve as judge in different departments, and we always hear a good word for John H. Pringle. At the last meeting of the state fair Mr. Pringle served as a member of the swine department, and I am told, was so pleasant and business like in his treatment of the persons who had exhibits that a unanimous vote of thanks was given him. I think that he is so well acquainted with all the members that he needs no introduction personally.

Mr. S. H. Todd: Gentlemen of the Convention, it was my privilege two years ago to present to a convention similar to this, my old friend E. C. Ellis, as a candidate for nomination to be a member of this Board, if that convention saw fit to choose him, to make him a member of the Board. I pointed them as I point you to his pioneer life, his faithfulness as a teacher and his devotion to his nation in her hour of peril. I say to you, gentlemen of this convention, his name comes up again, and I can say no more in his favor than to say to you that the remaining members of the Board want him back with them for the next two years. No person this morning can have any objection to him save that of age, and I say to you this is one of the reasons why you should, through your elective franchise, give him a place upon that Board. You say you might probably find better men. You might probably find vastly worse men than Mr. Ellis; and then in the words of the immortal Lincoln, I will say to you: "It is not wise for you to swap horses in the middle of the stream." Feeling sure that you will extend to him the welcome of a return to his old seat on the Board by throwing around him your power of elective franchise and letting him go down in his declining years from the stage of action, and having him feel that the loyal citizens of this state have sympathy for and confidence in him, who laid himself upon his country's altar to protect the liberties and the happiness of this people in the civil war. Hoping that you will sustain Brother Ellis by your vote, I leave this matter to you.

Mr. W. Y. Tenny, Miami county: I have the pleasure of presenting to this Convention the name of a gentleman who is not a stranger to the older members of this Board, the name of a gentleman who was a candidate two years ago before this convention for a place on this Board, and I think that the fact that he made an active and earnest fight has left us better acquainted with him than ever before. I believe the first ballot he only lacked one vote of receiving the nomination. There were three or four ballots and he only lacked three of receiving the nomination. He is a man in the prime of life, and in his position as secretary of the fair association of Mercer county, has built it up to what it is until it has a reputation in Western Ohio equal to any of our fairs. He is also secretary of the Western Fair Association, and I can assure you that if he receives your votes for the place, that he will be a credit to the state. I place before you the name of Charles W. Halthill.

Mr. U. H. Hester: Mr. Chairman and Gentlemen of the Convention: On behalf of the great agricultural interests of northwestern Ohio, I desire to present the name of a gentleman that I believe is well fitted for the position of a member of the State Board of Agriculture. The name that I wish to present is that of J. S. Stuckey of Van Wert county. Mr. Stuckey is one of the best farmers of our county. He has been president of the Van Wert agricultural society, which is one of the best in the state, for the last four years. For many years he has been a member of that board, and I believe that he is in every way well fitted and qualified for the position, and I hope that the gentlemen here will carefully consider his name in selecting members of the Board, and I assure you that no mistake will be made if he is selected as one of that honorable body.

Mr. F. S. Monnett: I have the pleasure of presenting the name of a gentleman for membership upon this Board, and the only fault that I can see about him is that he is so good looking that his business will be interfered with by the ladies calling upon him at the state fair. It is Benjamin Beall, of Crawford county. His record among us in Crawford county, both as a farmer and business man, and as a member of the State Agricultural Society, warrants me in saying that he will make one of the best men you could put in the position. He is a man that don't need any oratory such as your other candidates seem to have had. I would nominate Benjamin Beall, of Crawford county.

Mr. W. S. Miller, Coshocton: I desire to nominate a man who has been identified with agricultural societies for the last eight or ten years. One year ago he was made president of the Holmes county agricultural association. He found that association bankrupt, but he took charge of the matter in a business-like way and by careful management he reduced the indebtedness from \$2,400 to \$350. Mr. W. G. Rudy is recognized as one of the most substantial business men in the county where he resides. Being connected with a firm there for a long period of years,

that firm has as fine a reputation as any firm in that section of the country, and if you desire to-day to elect a man on this Board who is recognized for his fine abilities in the management of agricultural societies, gentlemen, you can do no better than nominate Mr. W. G. Rudy, of Holmes county.

Mr. J. Sidebottom, Belmont: I have the pleasure of nominating Mr. L. P. Bailey, of Belmont county, without any speech and without taking up your time.

Mr. F. A. Derthick: I rise to discharge a very pleasant service for a friend in presenting his name to this convention as a member of the Board, and that is L. R. Dunham, of Cuyahoga county. He is an old friend and schoolmate of mine, having known him all my life; the president of the Cuyahoga county agricultural society, a man who has made a success. He is a practical farmer, engaged in large farming operations, and I submit his name for your consideration.

And thereupon, on motion, nominations were closed, and a recess was taken until two o'clock, p. m.

AFTERNOON SESSION.

THURSDAY, January 14, 1897.

President Bower called the Convention to order at two o'clock and introduced Dr. D. N. Kinsman, of Columbus, who delivered an address upon "Tuberculosis in Cattle."

ADDRESS BY DR. D. N. KINSMAN.

Mr. President and Gentlemen of the Ohio State Agricultural Convention:

I believe it needless for me to say that I am pleased to have the opportunity of addressing the farmers of the state of Ohio, or those engaged in agricultural interests, upon a subject that is as wide reaching as tuberculosis. This disease may affect every animal that has a hot blood, as far as we know. But one animal in the whole world with a warm blood resists the inoculation of tuberculosis, and that is the little jerboa that lives in the northern part of Africa and elsewhere.

Tuberculosis is a disease that has been known to, these many cycles, probably as long as mankind has had a history. It was believed in early times to be a contagious disease. The old Italian anatomist, Morgagni, said that while young he feared the bodies of those who died of consumption, and he feared them still when he became old. And yet from these times to the time of Morton, who wrote the first book on consumption that was ever written by an Englishman, all believed in the contagiousness of tuberculosis, and it was afterwards believed, I might say, as late as 1840. Ruhlman had observed as early as 1784 that cattle that had a lung disease, would communicate it to other cattle living in that stable and in association with them. In 1865, Villemin, who was a French physician, inoculated twenty guinea pigs in a slight scratch upon the ear with the matter that came from the lungs of consumptives. After his first experiment, all but four of these guinea pigs became tuberculous. He announced this to the Academy of Medicine of Paris,

and they didn't believe a word of it. These experiments were carried on until it was finely settled that there was something somewhere about this tuberculous matter, which when introduced into healthy animals, would in a great number of cases produce tuberculosis. Tuberculosis is a disease that is not confined to the lungs by any manner of means. It affects every tissue in the body, hard and soft alike, as far as we know. So that when we speak of consumption, we are speaking only of a disease of the lungs that is shown in a majority of cases. We have bone diseases and liver and kidney disease, and skin disease and brain disease, and the diseases of the eye from tubercle. All of the structures of the body are affected by this organism.

Then this man demonstrated that this product that was expectorated from the lungs of a tuberculous persons if simply introduced into a body, would produce the disease. It was not until 1862 that it was finally announced what the actual cause of tuberculosis was. Koch made the discovery by the aid of aniline dyes, and the cause of the disease we know to-day is a bacillus. He found that by taking this matter and inoculating it into gelatine, after a time he could produce what he called a pure culture, a condition in which this bacillus alone occurred. This bacillus isolated in this way was introduced into the anterior chamber of the eyes of rabbits, and in this way the mode of development of tuberculosis has been discovered and demonstrated. It was found thus, that tubercular bacilli when introduced, the organism under favorable circumstances would in twenty days have completed its entire evolution in the production of tubercles.

It is a cell growth which becomes caseous and then it softens and is ready to invade another portion of the body, and thus the tuberculous growth extends from point to point and stage to stage. It develops itself in various ways. We have what we call a chronic form and an acute form. People will be inoculated and live from the first manifestations of the disease many years. I have known them to perish in forty-four days, showing that under favorable circumstances this organism may enter the body and produce its baneful effects within as limited a period as that of typhoid fever.

It is not limited to man, but, as I said, it affects all warm-blooded animals. In the city of Columbus during the last eight years, it has killed one in seven of all the men, women and children that have died there, that is the disease known as consumption; and if we add to that number all cases of brain disease, of kidney and liver and skin diseases in which we find tubercles, of the total mortality, the proportion would be, instead of one in seven, one in six or possibly one in five. This shows the mortality of this scourge we are talking of to be twice as great as that from diphtheria, scarlet fever and typhoid fever all combined. It is nearly twice as fatal as all the acute infectious diseases in this country. It kills more people every year than cholera ever killed in this country, and yet the people endure it without turning their attention to it. They endure it as patiently as the old Romans did the plagues of their time. What cannot be cured, people believe must be endured, but I believe to-day that a brighter day is coming. We know the cause, and knowing the cause we can combat it, and I am optimist enough to believe the time is coming when consumption, instead of sending one in seven of the total mortality to the grave, will be shorn of its strength and when it will be as little dreaded as small-pox in these times. And the story I have told you is true. Under the laws of the state, scarlet fever, small pox, diphtheria must be quarantined, while consumption is so far neglected. If scarlet fever and diphtheria are infectious and mortal, the same can be said of tuberculosis, and in addition, is more prevalent and deadly than either.

We know to-day what causes tuberculosis—and its only cause—more than can be said of either of the other diseases. We know how it must be met if this dire contagium vivium is ever successfully combatted. Quarantine and prophylaxis are

the only means at our command. "Cures" are impotent when the infection is established. Public sentiment has not been awakened upon this subject; the public has not been instructed. This work must be done, and the best place to begin is at home. And now is the time to begin.

Consumption or tuberculosis, can be communicated by inhalation, infection, or inoculation of the poisonous germs; and it is now known that it may be transmitted congenitally.

During all of the time that passed between the discovery of the infectiousness of tuberculosis by Villemain and the time when Koch demonstrated its true cause to be a bacillus, experiments had been going on all over Europe and America to find out the means by which this disease was communicated. It was found that if you took the sputum of patients and pulverize it and allow dogs to breathe this pulverized sputum they would develop tuberculosis, showing that it can be communicated by inhalation. We have then a long series of experiments in which of three hundred and twenty-two animals that were fed, in which there were horses, calves, sheep, goats, hogs, rabbits, dogs, cats, guinea-pigs and pigeons, forty-five per cent. of all these animals died with tuberculosis. It had been demonstrated that not only was the tuberculous matter as shown ordinarily in the glands and in the lungs, tuberculous, but it has been shown also that this product, this bacillus, existed at times in the blood, in the lymph, in the muscular juices of the body.

Two cubic centimeters of the juice expressed from the muscles of a tuberculized heifer caused general tuberculosis in the rabbit. The muscles of a tuberculous sow were cooked as long as a beef-steak usually is. The red blood expressed from these muscles was used to inoculate two rabbits. Two other rabbits were inoculated with the juice of these muscles raw. Those inoculated with the juice of the raw muscles died of general tuberculosis. One inoculated with the cooked juice died the fifty-sixth day thereafter, generally tuberculized. The other, weak, sick and emaciated evidently soon to die, was presented to the Paris academy. The muscles of a very fat beef whose lungs were tuberculized were heated to 52 degrees *centigrade*; at the centre, the juice was expressed and fed to four rabbits, at two meals. All were placed in the same cage. One slain thirty-five days after was found tuberculous. All died tuberculous before the 120th day. Muscular juice and blood of tuberculous animals were exposed to temperatures 61, 63 and 65. This heat coagulated the fibrine. Three lots of rabbits were inoculated with this material; all died tuberculous before the eightieth day. Ten rabbits were in this experiment. For two minutes *Toussaint* heated muscles to a temperature of 70 to 71 *centigrade*. Two rabbits inoculated with this juice died tuberculous in 85 and 114 days. He afterwards inoculated animals with the tuberculous products from the lungs of these rabbits subcutaneously; they became tuberculous and died in eighty days.

The object of this is to show that this poison is not limited as is thought to glandular manifestations, but it does exist in the blood and in the lymph of animals. Indeed the place where tuberculosis ordinarily manifests itself is along the lymph canals. Nor is this disease confined to the human family. It affects all of our domestic animals in a greater or less proportion, and is the special scourge of our cattle whose milk and flesh we use for food. Tuberculosis has not been observed among sheep in the state of Massachusetts. This disease has spread over nearly the whole globe; and many regions which were unaffected in 1840 are now daily paying tribute to this destroyer. The experience of the South Sea Islands witnesses to this fact. Bovine tuberculosis prevails over all Europe, but less in the more northern sections. It has invaded Australia, New Zealand, Canada, the United States, and South America. It increases in virulence and infectiousness, *pari passu*, with the increase of temperature. Another startling fact to be mentioned is, that where most use is made of the products of bovine herds there tuberculosis commits the greatest ravages upon the *human* family.

If we can trust statistics, the last twenty years has seen an enormous increase of tuberculosis among cattle. In 1877, in Bavaria, there were found 1.62 tuberculized animals per hundred. From 1879 to 1881 there were found at the abattoirs of Augsburg 2.5 per 100. In 1875, at Munich, 1.15 per hundred; in 1880, 2.4 per 100.

Statistics from abattoirs in Germany show that among 51,427 slaughtered animals, 0.6 under six weeks of age were infected; 0.6 from six weeks to one year; 11.4 from one to three years of age; 33.11 from three to six years of age; 43.4 *over six years of age*.

Abattoir statistics from Berlin: Before 1892 there were 12 per cent. infected; in 1892-93, 15 per cent. infected; in Saxony, in 1893, 18 per cent. infected.

In Leipzig, from 1888 to 1894, the number of cows infected rose from 17.5 to 31.1 per cent.

In Schwerin, the number of infected cows rose from 12.83 per cent., in 1886, to 37.60 in 1894; and the number of infected bulls, oxen and calves increased in an equal ratio.

The following statistics are from widely separated places: Prussia, among slaughtered animals, 9.5 per cent. infected; Berlin, 12 per cent. infected; Dresden, 14.4 per cent. infected; Bromberg, 26.2 per cent. infected; Upper Silesia, 9.5 per cent. infected; Midlothian, 20 per cent. infected; Yorkshire, England, 18.7 per cent. infected; London, 25 per cent. infected.

In this country our statistics are gloomy. Of 26,958 animals tested by tuberculin in Massachusetts, 4,389 were found to be tuberculous. These figures will give us authentic information for that state, for no other has entered systematically upon this work. The proportion of tuberculized animals found at the slaughter-houses was 1 per cent. The reasons for this will be obvious upon reflection. Most of the animals shipped to the stockyards in this country are young. They have had the range of pastures, and have never been stable-fed, because the climate where they are fed is such that they are kept in the open air. Confinement in stables is dangerous; it is there that infection spreads the most surely and rapidly.

Most of the information given above is taken from the Cattle Commission's Report to the General Court of Massachusetts. It need not be extended further upon this occasion, although it could be indefinitely. The statements are worthy of careful consideration. They show that not only is this disease increasing among cattle, but that the proportion of aged animals affected is *nearly* one-half.

In the state of Massachusetts, where there is a systematic effort being made to stamp out tuberculosis among cattle, the condition of affairs is not less alarming on the farms. Of twenty-two herds, aggregating 779 animals, 317, or 40.6 per cent., were found infected. One fine herd of five, which supplied milk for children alone, furnished five infected animals. In another instance, a herd of selected animals kept in the best possible environment, 64 animals showed 60 infectious, and these animals furnished milk for food. Nor are cows alone affected, for hogs and fowls are also subject to tuberculosis.

The flesh of the tuberculized animals may, and does, contain tubercular bacillus; and it has been found that meat grilled at a heat which showed 70° C. at its center furnished material for successful cultures of bacillus tuberculosis. Yet this heat is sufficient to cook meat sufficiently to be eaten.

The physical condition of the animals does not give indications sufficient for diagnosis. They maintain flesh, continue to feed well, and give a good quantity of milk when tubercular lesions are far advanced. Cattle have been slaughtered for beef, and have been and now are being used for food whose lungs show grave ravages of the disease.

Milk of tuberculized cows, whether the udder is diseased or not, may contain the bacilli, and the milk of any such cow is a threat to the consumer. Ever since

Villemin, thirty years ago, demonstrated the infectiousness of tuberculous matter, experiments have been going on, which show the danger from meat and milk of tuberculized animals. The Royal Commission of Great Britain, in 1890, fed pigs, guinea pigs and rabbits their usual food, to which was added the flesh and milk of tuberculous animals, always uncooked, and obvious tubercular material was voided. Thirty-six per cent. of the pigs, sixteen per cent. of the guinea pigs, and fifteen per cent. of the rabbits were infected.

Woodhead conducted a similar set of experiments. Result—100 per cent. of pigs, 100 per cent. of cats, and 75 per cent. of the guinea pigs became infected. Can we longer doubt from this array of terrific facts that our food animals have a very intimate causal relation to consumption among men?

You will bear in mind that with these experiments these animals had become infected to a proportion greater than the proportion among men.

How is this state of affairs to be met?

During a recent visit to the city of Boston I called at the office of the Cattle Commission to learn their methods and secure what documentary information they had, which was most cordially given, and I hereby acknowledge my debt to the eminent gentlemen of this commission. Appropriations have been made as follows for the work of the commission: 1894, \$35,000; 1895, \$100,000; 1896, \$300,000.

Massachusetts never does anything by halves, and being convinced there is a stern conflict to be waged with this foe of human life and her animal industry, she has furnished the sinews of war with a lavish hand.

First, a quarantine has been established against the entrance of all cattle upon her territory, except when destined for immediate slaughter, unless they have been inoculated with tuberculin within a limited time before a permit is granted for bringing the animal into the state. All animals must be covered by such a permit, even when the owner brings the animal from his own farm in the adjoining states to his farm in Massachusetts. All animals slaughtered for market are inspected, and passed if free from disease, otherwise condemned and rendered *unfit* for food. Tuberculin is used in all cases as the means of diagnosis, and the test is repeated if unsatisfactory.

Let me say this, that it has been urged that this is not a good thing because it fails occasionally. Tuberculin is used in all cases as a means of diagnosis. It is the surest test we have, and succeeds in 90 per cent.

Tuberculin is a culture of the bacillus tuberculosis sterilized by heat. The temperature of the animal is then carefully taken, the injection made, and if in the following ten to twenty-four hours the animal has a fever developed in which the temperature rises from 2° to 4°, the animal is said to have "*reacted*," and is condemned. I was informed this test had never failed when properly applied. The tuberculin contains no living germs, and cannot be the source of infection.

Much opposition developed to the use of this agent—the result of ignorance and bigotry—but it has become an admitted fact it can do no damage, and the progress of the work is going on without opposition, under the provisions of law, which provides that all cattle brought into the state shall be tested previously; that all cattle suspected of having tuberculosis by a veterinarian shall be inoculated with tuberculin, and all herds at the request of the owner.

When a diseased animal is killed, a nominal sum is paid therefor upon appraisement, not exceeding sixty dollars. The state has been divided into districts, and a systematic test of all animals in the state is now being made. The stables in which the infected cattle have been kept are thoroughly renovated, and mercuric chloride and carbolic acid in solution are used to saturate the mangers, floors, stalls, etc., and the woodwork is washed. By keeping all infected cattle out of the state, killing all infected cattle in the state, and by rigorous hygienic measures, the Cattle Commission expects to banish bovine tuberculosis from the state, and I believe they will

succeed; and then I feel sure we shall hear, in the years to come, that the number of cases of tuberculosis among men will have become greatly diminished. And then measures will be taken to eradicate this scourge finally from among men.

I am fully convinced that this is the most important subject which can demand the attention of any government. All the infectious diseases are giving up the secrets of their power. They depend upon germs which can be destroyed; or, in other cases, the organization can be rendered immune to their baleful influence. Pasteur, Koch, and their pupils have indicated to us their modes of assault. Small-pox has lost its terrors not because it is less terrible to the unprotected, but because vaccination has clothed man with immunity. In like manner, diphtheria, hydrophobia tetanus have, under favorable circumstances, become less formidable.

No bacillus tuberculosis, no consumption, is an admitted fact. We can limit its dissemination if we will. The measures to be used for this purpose are plain and practical. Abolish so far as possible all sources of contagion that are known which assail us through food, and then establish a hygienic regime around persons who already have consumption.

We must educate the people. We must teach them that consumption is contagious; we must tell them where this contagion is produced, and how to guard against it. It took years to convince the medical profession of these truths, and many are not yet convinced. The people will follow our lead.

It is the opinion of the profession to-day that consumption is an infectious or "catching" disease, and the community should be instructed that such is the case. Tuberculosis is caused by the bacillus tuberculosis, and not by colds, dust, and foul air, as was formerly believed. This bacillus is found in the matter which patients cough out of their lungs, and when the bacillus gains an entrance to the body it causes tuberculosis. It enters the body through the stomach, through the lungs, or through open wounds. When matter containing the bacillus coughed from the lungs is spat upon the ground, floors of buildings, street cars, and the sidewalks of the streets, it is dried and pulverized and may be taken by the winds and blown in all directions, to be inhaled into the lungs of all persons exposed thereto. The tuberculosis bacillus is introduced into the stomach and bowels by the use of the flesh of tuberculous animals and drinking the milk of tuberculous cows; the use of spoons, cup, etc., which have been used by tuberculous patients before they have been thoroughly cleansed. Open wounds may be soiled by tuberculous matter.

Consumption, we believe, can be greatly limited, and preventing its spread rests with those who have the disease. They can enjoy society and all the pleasures and comforts of life, and avoid being the means of communicating it, by the observance of certain precautions which are neither difficult nor burdensome. Even if these precautions demand constant care on their part, it should be a pleasure for consumptives to exercise it, for they thus protect those who love and care for them.

The sputa of all consumptives should be destroyed and never allowed to dry. The destruction can be accomplished by spitting into a cup or flask containing a disinfecting solution, when in the house. The disinfecting solution can be made by dissolving a bichloride of mercury tablet, which can be procured at any drug store, in a pint of water, or by adding ten to twenty drops of carbolic acid to a gill of water. Only a quantity sufficient to cover the bottom of the spit cup to the depth of about half an inch is necessary each time the cup is put in use. When the sputum has been thus disinfected it can be thrown into the sewer.

When out of doors a consumptive should carry a pocket flask, closet paper, or a piece of cloth to receive the sputum. The disinfecting fluid should be used in the flask, and the paper or cloth should be burned at the earliest convenience. The pieces of cloth and paper should never be used but once. Never spit on the floors of street cars, public buildings, or stores. Healthy persons should not sleep with consumptives, nor in rooms occupied by them. All rooms which have been occu-

pied by consumptives should be disinfected by the same process which is used in the disinfection of rooms where patients have had scarlatina or diphtheria. All dishes or spoons used by consumptives should be washed in boiling water before being used by other persons.

If there is any suspicion of danger from meat it should be thoroughly boiled, and for the same reason milk should be sterilized or boiled. The bedding and clothing of consumptives should be washed separately and thoroughly boiled. The discharges from the bowels of consumptives should be disinfected, especially if they have tuberculous ulceration thereof.

The President: This subject so ably presented by Dr. Kinsman will be discussed in a paper by Dr. David S. White, professor of veterinary science, Ohio State University.

TUBERCULOSIS IN CATTLE.

PREVALENCE AND DISTRIBUTION.

Tuberculosis in our cattle is the most prevalent and widely distributed of all bovine plagues. No land where cattle raising and dairying are a source of national prosperity is free from its ravages. In certain parts of a cattle producing country, depending mainly upon the conditions under which cattle raising is carried on, its prevalence may vary. While upon our western prairies and upon the steppes of Russia, tuberculosis rarely occurs, in the more densely populated sections of the United States and the "Land of the Czar" the "White Plague" flourishes as a threat to man and a foe to the cattle industry.

Unfortunately no exact statistics can be given at this time as to the relative number of cattle afflicted with this scourge as compared to the total number of living bovines. In our own country, especially, such statistics are but meagre. Of 14,050 animals tested by the Department of Agriculture 11,582 were healthy and 2,468 diseased (17 per cent). In Germany, according to Siedamgrotsky, in the state of Saxony (excluding calves), in

1888.....	5 per cent.
1889.....	9 per cent.
1890.....	16 per cent.

This would seem to show that tuberculosis were increasing, and though I do not doubt that this is so, these marked deviations in the number of animals found to be tuberculous are probably explainable more from the fact that the government meat inspection was gradually being more rigidly enforced than that the disease itself was increasing at this apparently alarming rate. Even in the thickly peopled German Empire tuberculosis is seemingly more prevalent in certain districts than in others. In the district of Argenmuende, for instance, among 13,000 cattle slaughtered, none were found to be tuberculous, and in the district of Teltow, among 40,000 head killed, only fifteen cases appeared. Dr. Ostertag's observations at the Berlin abbatoirs show, on the other hand, that 25 per cent. of the adult cattle slaughtered there for human food are tuberculous in a more or less degree. Age plays an important part as to tuberculosis prevalence. Yearlings and under are rarely affected but with every year of advancing age the chances of escape become less. Old milch cows (ten to fifteen years) are rarely immune. On an average Ostertag found 75 per cent. of these old dairy veterans carrying scars of their battles with grim phthisis. Since the introduction of tuberculin as a means of unearthing consumption in its hidden

forms some new fields of statistics have been thrown open to us. Bang, of Denmark, tested with this agent 53,303 head of which 20,665 head reacted and were found tuberculous. In the state of Massachusetts 26,958 tested and 4,389 reacted. One herd tested by myself in Ohio showed 30 per cent. to be afflicted.

Tuberculosis is seldom found among calves. From Siedamgrotsky's figures, to one tubercular calf there are fourteen tubercular bulls (and as many yearlings of both sexes), 38 steers and 164 tubercular cows. This may be taken as the general average.

CAUSE OF TUBERCULOSIS.

A microscopic plant of low order discovered in 1882 by R. Koch, a German physician. This plant, a small rod-shaped body, the bacillus tuberculosis, is the one and only cause of the disease. Without this germ entering the animal body tuberculosis cannot be induced. In and in-breeding, the wedge-shaped chest of the typical dairy cow, feeding kitchen offal, brewery grains, mouldy hay, lack of exercise, keeping up in stables, catarrhs of the bronchial tubes, and so on *ad infinitum*, are but the predisposing causes which prepare the victim for the initiation the stealthy tubercular Bacillus has in store for it. They in themselves cannot cause the disease.

ENTRANCE OF THE GERM.

1. The germ of consumption enters the animal body most frequently through the organs of breathing. This is evident from the fact that healthy cattle, cohabiting with tubercular ones, in 90 per cent. of the cases contract the disease in the form of broncho-pneumonia, i. e., we find in the lungs the primary lesions of the disease. Through the air the germ is transmitted from the sick to the healthy, borne upon particles of dust or the dry ejections of a phthisical animal.

2. A second way of gaining entrance to the body is by way of the digestive tract, i. e., by the animals ingesting the germs with its food. This mode of transmission is not so common with our animals. Calves are most commonly infected in this way through the milk of consumptive cows. Of course it cannot be denied that an infection is possible from cattle licking up the tubercular sputum, eating out of infected mangers, etc. A primary tuberculosis of the bowels, however, is comparatively rare in adult cattle and when present is most commonly traceable to an outo-infection (from lungs).

3. By the act of coitus the disease may be transmitted. This is rare in animals.

4. By wounds.

5. Lastly a direct infection of the udder by way of the teat canals must be admitted as a probability.

SYMPTOMS.

Very variable. They depend upon the organ or group of organs the disease may attack. In a large percentage of cases, especially in the earlier stages of the disease, the animals present no clinical symptoms whatever or perhaps only a mild bloating of the abdomen from gas that may appear at periods. Clinically considered there are two forms of tuberculosis. First, the tuberculosis of the organs; mainly of the lungs. Second, a tuberculosis of the serous membranes lining the cavities of the body as the pleura and peritoneum. This form is known usually as pearly tuberculosis. In the lung form in the better developed stages of the disease we have two symptoms that are usually present; first, cough which can be artificially produced by pressing the upper part of the windpipe between the fingers and secondly, by placing our ear to the sides of the chest, behind the elbow, dry rales or rattling noises may be heard. These are the most common and constant symptoms of the tubercular-broncho-pneumonia.

The condition of tuberculous animals varies too greatly with the individual to be of much service to us in diagnosis. Very often tubercular animals are exceedingly fat, well nourished and slick looking. Only when the disease is well advanced do we find the animal's condition appreciably disturbed. Here the hair loses its lustre, the animal becomes hide bound, the skin dry and leathery, emaciation though the appetite remains unimpaired, the mucous membrane of the mouth and eyelid become pale, the temperature rises above or falls below the normal, pulse weak, breathing hurried, finally diarrhœa and death. In pearly tuberculosis the grating of the diseased pleura of the chest walls against the roughened covering of the lung, can be heard on auscultation, but this is rare. A tenderness is evinced on pressure on the ribs at times, but this is not constant. Symptoms of nymphomania when the ovaries are diseased. Enlargement of available superficial, lymph glands of throat, groin, etc., but this may be absent. Changes in the udder, if this organ be diseased, whereby it may be enlarged to four times its normal size and stone hard, or in another form there may be felt in its depths hard nodules. All these are but a few, the most common, of the symptoms that belong to the category of the consumptive. In no one animal are they usually all present and in only a few cases (advanced stages) are they well pronounced. Nearly all of them, too, are symptomatic of other diseases foreign to tuberculosis.

DIAGNOSIS.

Formerly the diagnosis of the outbreak of tuberculosis among a herd of cattle was secured only after a post mortem examination had been held upon at least one of the animals. Though some older veterinarians considered certain symptoms pathognomic of the disease, they felt that only an autopsy was positive. In 1890, at the Veterinary Institute in Dorpat, Russia, Koch's tuberculin was tried upon notoriously tubercular cattle to note its effect upon consumptive animals. In each case after the use of this agent it was noticed that the blood temperature, as measured by a clinical thermometer, was elevated above the normal, two degrees centigrade. This first drew the attention of veterinarians to the value of tuberculin as a diagnostic agent. In non-tubercular cattle it rarely induces fever. Since that time thousands of cattle have been subjected to tuberculin tests and in nearly every case the value of this product as a diagnostic agent has been confirmed. This grand discovery of Koch, alone places us in a position to discover tuberculosis in its latent form.

DEALING WITH TUBERCULAR CATTLE.

In the state of Massachusetts in 1894 a plan was set on foot to eradicate bovine tuberculosis by subjecting all the cattle in the state to a tuberculin test, butchering all those that reacted, and destroying the meat thereof by injections of some indelible coloring matter. This exceedingly drastic method has not met with favor among the best scientific minds, and as a Harvard professor writes me the "waste of good beef has been fearful." The results, too, as far as I can gather, have not been very satisfactory. Though *theoretically* one must admit that this way of dealing with consumption among cattle is an apparently effective one, practically a measure of such proportions can be yielding of no great results. As long as all tuberculosis comes from one and the same source, is caused by one and the same germ, the bacillus tuberculosis, is transmissible from one animal kind to another and from man to animal, I, for one, fail to see how, by killing off the one kind and allowing the other still to live and perpetuate the disease, that we may hope to permanently and forever crush it out.

1. We have no way of determining absolutely the presence of consumption in an animal. Tuberculin is by no means infallible. We are at times misled by its use to make a false diagnosis. These false diagnoses are of two kinds, either

tuberculin causes a reaction where the animal is not tubercular, or there is no rise in temperature when the disease is present. Dr. Eber recently made autopsies upon 563 animals condemned as being tubercular by a tuberculin test. The autopsies corroborated the tuberculin diagnosis in 489 instances and failed to do so in 74 (14 per cent.) In Denmark 515 post mortems showed 50 false diagnoses, nearly 10 per cent. That at times, notoriously tubercular cattle do not react to tuberculin is well known to everyone who comes into practical contact with its use. Though as a rule a strong tuberculin reaction is noticed in mild cases of tuberculosis, while cattle more severely affected react only in a slight degree or not at all, this is not always true. Many mild cases show no reaction. In short from the degree of reaction conclusions as to the development of the disease can not be drawn to any great certainty.

2. Very often the tubercular lesions are very insignificant, the disease may remain localized and latent for years or for the animal's lifetime or a cure may take place.

3. Young beef cattle, in our country especially, are comparatively free from the disease. Tuberculosis is nearly always an acquired disease. A prolonged co-habitation with consumptive animals is requisite for its spread. From abattoir reports that I have at hand, among half a million steers killed at Chicago only a little over half a hundred were diseased. In fact more hogs were found to be tuberculous than steers at the age they are usually slaughtered; relatively nearly twice as many.

4. From the milk and organs (viscera) of diseased cattle is tuberculosis most commonly transmitted from animal to man. The meat of tubercular animals is only under certain conditions unfit for food, i. e. when the disease is generalized which is rare in cases where we must depend upon a tuberculin test to make our diagnosis. By far the greatest danger comes from the milk of tuberculous cows. Cows kept for dairy purposes are most commonly the ones affected. Therefore I would suggest that for Ohio a less radical and more practical method of eradication be adopted in dealing with tuberculosis among our cattle. Such a method as is now being successfully carried out in Denmark under the supervision of Professor Bang.

"Therefore for milk yielding countries I prefer for the present to recommend the less radical method which I have introduced into Denmark. This consists of the following features: First—To inoculate the herd with tuberculin. Second—To separate the reacting animals as far as possible from the non-reacting, making two divisions. Third—To kill the evidently sick animals either at once or after rapid fattening. Fourth—To rear the calves of the cows which react, but otherwise appear healthy or at least only slightly attacked. Fifth—To remove the same immediately after birth from the infected stable, place them in the healthy division and protect them from further infection especially from milk feeding. Sixth—Carefully disinfect the stable. Seventh—Inoculate the animals of the healthy division once or twice yearly."

This method rests upon the assumption first, that the infection is the only cause of tuberculosis, and second, that the germs are not present everywhere but that infection is caused by the continued living together through a long period of time of tuberculous cattle, and further by the rearing of calves on raw milk from tuberculous cows.

DAVID S. WHITE.

The President: The next on the program is an address by Mr. Alexander Galbraith on "The Horse—His Status with Relation to Breed, Demand and Profit and the Future Prospects."

ADDRESS BY MR. ALEXANDER GALBRAITH.

Mr. President and Gentlemen of the Convention:

The outlook for the future of any branch of business should be gauged by a combined view of the past with the conditions governing the present or likely to govern the future. We cannot, of course, rely upon history repeating itself in every case, but it is always instructive for us to glance back over such period as our memory will safely carry us, and examine the historical data beyond that period and study the causes producing certain results. Looking at the American horse trade as a whole we find that during the past forty years there has been at least three periods of great depression. From 1857 down to 1861, the outbreak of the civil war, business of all kinds was dull, but we learn on the authority of such veterans as Mr. F. J. Berry, of Chicago, that the horse business was especially bad and unprofitable, that prices at that time were as low as they have been in recent years, but the outbreak of the war gave them an increased value, with the result that farmers got good paying prices for their horses up until the year 1873, when we had the great commercial panic. At this time, as you know, everything seemed to go to pieces, and although confidence was soon restored, there was great depression in general business for a period of about five years. During this time horses suffered in value very greatly, but along toward 1878 they steadily recovered and advanced in price. About this date a general taste for better horses seemed to manifest itself among our farmers and city men throughout the whole country. A great many importations were made, from all of the various countries of Europe; for a period of about a dozen years or so thereafter an enormous number of stallions of all the European draft and coach breeds, including the Percherons, the French Draft, the Belgian, the Clydesdale, the Shire and the Suffolk Punch (the last named being in very limited numbers), were brought across and distributed freely almost from the Atlantic to the Pacific oceans. The coach breeds included the Cleveland Bay, the French coach, the German coach, and in later years the Hackney. Those horses were sold to farmers and ranchmen throughout the whole of this country at prices generally ranging from \$1,000 to \$2,000 apiece, some exceptional animals, of course, exceeding those figures considerably.

While a great many of those imported stallions were of superior merit and of choice breeding a still larger number were of such an inferior class that their introduction has proven a great detriment to our horse stock. This evil has also been greatly aggravated by the short sighted policy of our farmers most of whom prefer using an inferior sire at a cheap service fee rather than a superior one at a reasonable fee. This species of "penny wisdom" was followed by the inevitable "pound foolishness" and the results were everywhere most disastrous. An uninterrupted period of general prosperity all through the decade between 1880 and 1890 aided in the advancement of prices of horse flesh. The business boomed. Everybody handling horses made money, and every farmer and ranchman in the United States went into the business of horse breeding. On all hands we would hear farmers say "Why should we raise cattle or sheep or hogs when we can raise a three-year-old horse as cheaply as a steer, and the horse will out sell a steer three times over?" The question was undeniable. It appealed to a man's reason and his pocket book, and the result was that he went into horse breeding. A few acted judiciously, choosing a superior and suitable class of animals and consequently made a grand success and made far more money by breeding horses than any other animals on the farm. The great majority, however, bred horses indiscriminately; were careless about their parent stock; they used inferior sires, neglected their colts or were carried away by some ridiculous hobby of their own. Many otherwise intelligent men led a forlorn hope in their vain endeavor to produce that myth called an "all purpose horse," which in my opinion is equivalent to a no purpose horse. Many farmers of a sporting tendency endeavored to raise the fast trotter, but their lack of

knowledge and experience in this business resulted in nine out of every ten cases in a dismal failure. However, I would emphasize the fact that the average farmer and stallion owner who showed ordinary good judgment made lots of money off their horses up until about the year 1890, and during that period we must remember all the other farm animals had their ups and downs, and not one of them but touched cost or below cost during that period, the horse alone excepted. Then the tide turned. Farmers realizing that prices were falling, commenced unloading. The increased weekly receipts in the Chicago market bore down prices constantly and steadily. Farmers sold off their best geldings first and then their brood mares, and they have been tumbling over each other ever since to get out of the business, and the result is that the horses they now have are the "tail ends" and of little value.

The depreciation in horses caused by this vast overproduction on the farms and plains of the United States, was simultaneous with and intensified by that wave of general commercial depression from which all interests have suffered during recent years. The horse industry has also been injured to some extent by the substitution of electricity on our street car lines and perhaps in a less degree by the advent of the bicycle.

Another cause that has helped to keep prices low during the last year or two was the large proportion of four year old horses put upon the market. Horse buyers don't care to purchase anything under five years old, so by knocking the corner teeth out of the four year old's mouth he passes in the market as a year older than he is. But even here the law of compensation takes effect, for in proportion to the number prematurely marketed last year there will be all the fewer this year. And not only so, but those immature horses will not stand the work that more mature horses will, and consequently their replacement will become an earlier necessity.

The number of brood mares and castrated stallions placed on the market during 1895 and 1896 has also been enormous, there being actually more mares than geldings sold, and in this fact lies the most discouraging feature for our future supply.

I will read you an extract from an address delivered by Professor Hughes, of the Chicago Veterinary College, bearing on this question. Dr. Hughes has perhaps the most extensive practice of any veterinary surgeon in Chicago. He says:

"Two causes are directly responsible for this. First, the panicky condition prevailing during the past two years; and second, over production of scrub horses. What has been the result of the first condition with regard to the use of horses?" Were you to interview the horse owners of the cities—who are the principal consumers—during the past two years, the team owners who haul groceries, hardware, dry goods, or a hundred other staple articles, and who own from ten to one hundred horses each, they would tell you that their horses were eating their heads off, that their business was demoralized, and that they were unable to meet their feed bills; that they would sell off their stock if they could get anything like their value, or that they would have them destroyed, but that they live in hopes that business would pick up. Were you acquainted along the boulevards and swell residence districts in the city, you would find horses disposed of for what they would bring, the coachmen discharged and stables tightly locked, the owners being constrained to practice economy owing to the stringency in finance. Here, then, we have demand, the grand potential factor in influencing price, seriously interfered with, in fact perverted. Here we find the consumers, the utilizers of horse flesh, the men who annually purchase thousands of horses, reduced by the state of the times, to a condition approaching positive want, and for the same reason it may also be remarked, there are thousands of horse owners, some of whom are wealthy, who are satisfied to plod along with their worn out stock rather than invest in new ones. Coincident with this depression, the supply increased rather than diminished. Overproduc-

tion of horses in this and all the neighboring states, augmented by an inpouring of range bred horses, glutted the market and kept glutting it, driving the prices lower and lower each succeeding month, until the breeders discovered that it would pay as well to slaughter their horses and feed them to hogs, rather than consign them to the union stock yards. On the ranges canning establishments were erected and the horse meat put up for foreign shipment. This, gentleman, is a sad commentary on man's noblest friend, but should a judge examine the quality of animals reaching the stock yards during this time, he would find seventy-five per cent. of these horses the worst kind of rubbish, and it is also worthy of remark, notwithstanding the hard times, the sound shapely horses brought prices which amply compensated their owners. Naturally breeders felt chagrined and promptly proceeded to quit the business, incidentally castrating their stallions. From the standpoint of a veterinarian and judge of horses, I firmly believe that the country generally and the veterinary profession particularly, will be markedly benefited by this overproduction and consequent depression. It should teach the horse breeder to study the market and to intelligently breed a type or class of animals that is most salable. It will teach the range breeder that crippled city cast off mares mated haphazard with a miscellaneous collection of stallions will breed true to type, and that there is no market for undersized slabsided ewe-necked creatures possessing but a faint resemblance to a horse. Now, however, that breeding is so generally suspended, where are the horses to come from that will be in demand, say during the next five years? That the financial depression of the past few years cannot continue to exist is the opinion of all business men and financiers. Crops have yielded more abundantly than usual; mills and factories are again running full blast, wages of workmen in such industries as iron smelting and finishing have been raised, and taken all together, the signs of the times are healthy. With the return of good times will inevitably appear the demand for draft and driving horses, and it is to the production of these that the breeder's attention should be earnestly directed. The day of the undersized driving horse is past, for, if salable, he must be stockily built and have an imposing carriage and fine action. The revolution in carriages and harness that has taken place during the past few years demands this. Size and substance with fine outlines and clean action will be the great desideratum in the markets of the country. Style and action will sell the animal, high speed being a secondary consideration. For some time there has been an active demand and high prices commanded by horses of this description. Now, that breeding has suspended, where can they be procured? The horse family differs from that of the other lower animals in not being a specially prolific one, and one that matures late, and when it runs down takes a much longer time to replenish. Taking all the facts into consideration, it may be confidently predicted that within five years the price of horses will be higher than at any previous period. We are told that the advent of electricity and the bicycle will annihilate the horse. We admit that the former has already done so in the case of the street car horse, but there it stops. In conjunction with the public we are glad to see this animal abolished. At his best the street car horse was never more than a cheap and misshapen mongrel, the breeder of whom could realize much more by breeding a good draft or driving horse. The country is well rid of such a type of animal. It is proposed to substitute electricity as a motor in connection with our wagons for hauling, and on our carriages for pleasure riding. Those who understand its application state at its present cost it never can become practicable. Fancy a man relinquishing his fine driving team for an electric motor. Surely it is the consciousness that a man is sitting behind an animated horse or pair that gives zest to a drive. So far as the bicycle is concerned, it may have in the past years, but in the years to come it will not and cannot injure the profession. The bicycle is a fad, and being such is necessarily short-lived. Fadism is a spurious sort of progress. It progresses only when the investi-

gating spirit bids goodbye to common sense and starts out on its own accord. Fads are simply the hasty products of superficial minds made possible by the ignorance and credulity of the masses, and so it is in cycling. The effects beneficial or otherwise, of this practice have given rise to much medical discussion, and opinions expressed differ materially. There is another and more potent reason, however, as to why the bicycle cannot prove injurious to the horse interests and to us as a profession. In civilized countries there exists as a rule both the richer and poorer classes. Riches invariably produce in its possessor an ever increasing desire to live above the level of his less fortunate brother. At the present time, when bicycle factories are so numerous and prices so low that a wheel is within reach of almost everyone, is it to be supposed that they will be indiscriminately used by rich and poor? Most certainly not. Class prejudices and distinctions will be sure to assert themselves and the bicycle field will be monopolized by those who are unable to, and as a consequence never kept horses. The bank clerk may have his wheel, the cashier will have his saddle horse, and the president will have his four-in-hand."

Now, as to the future. As stated in my address on Tuesday, the farmers throughout the whole United States have gone to the opposite extreme, and instead of producing too many horses are now producing far too few. I am safely within the mark when I state that the total production of this whole country is not twenty-five per cent. of the number of horses required to replace those now in harness. Where is the balance to come from—the other seventy-five per cent? I learned in an English magazine the other day, from a high authority, that in England they do not produce over 25 per cent. of the harness horses used in the city of London, and that market is looking to the United States for its future supply instead of as previously to Germany and France and some other European countries. The Chicago commission men are unanimous in their declaration that a shortage is inevitable before the end of the century, and several of those dealers are already breeding many mares of their own, an evidence of "the faith that is in them." The most discouraging feature is the fact that so few really desirable mares are now in the farmers' hands. But even if we had these mares, see how much time is already lost. Mares bred this season, 1897, will have their colts in 1898, and it will be 1902 before those colts are four years old, or fit to go in harness.

Now, does anyone here believe that between now and 1902, there shall be no improvement in trade? I cannot imagine any one believing that. But even taking the worst possible view of the matter and assuming that no improvement takes place and no increase in population, if you can stretch your imagination that far, how can we replace the present stock when we have no visible supply? I think I can hear some of you suggest motor-cycle. Well, my opinion is that the practical motor-cycle is about as far away as the flying machine. They are expensive, cumbersome, filthy and impracticable. The great race at Chicago, in 1895, for which one of the great daily papers offered \$5,000, was a miserable failure. About thirty entries were made, six machines started, and two finished, or rather one finished, because the second went into the ditch, and the machine that made the run of fifty miles did so no faster than a good Shetland pony could have done it.

It is sometimes asked why prices don't advance in the horse market. You might as well ask why doesn't the grain market or the cattle market, or sheep market or hog market advance. But there is another and a special reason why horses do not advance much, and it is a reason generally overlooked. It is this, that the grade of horses is steadily deteriorating. Why? Because horse buyers select the best animals all the time, and when they return to buy again they can only get what they had previously rejected, the result being that those now coming into the market are inferior to the supply a year ago, and very much inferior to those of two and three years ago. Although the supply in the market is large, still the total number is being weekly absorbed. We are using them up rapidly in the cities and in the

pineries of the northwest. We are sending many thousands down south to replace mules; we are killing thousands in the far west for canning and for glue-making, and we are exporting them to Europe at the rate of 50,000 per annum.

Now, let us act intelligently and study and cultivate this export trade as well as our home market. Let us breed for a special purpose and set our standard high by using the very best material at our command. Feed our colts liberally and judiciously; exercise and handle and market them as our best judgment dictates, and from the experience of the past beware of the rocks and quicksands of indiscriminate breeding. Take courage and

"On reason build resolve—that column of true majesty in man."

The President: Gentlemen of the Convention, Prof. F. M. Webster, Entomologist of the Ohio Agricultural Experiment Station, will now address you on the San Jose scale.

ADDRESS BY PROFESSOR F. M. WEBSTER.

Mr. President and Gentlemen:

I do not want to take very much of your time, but simply enough to give you a word of warning. Three years ago from this desk I told you of the first discovery of an insect pest, the San Jose scale, in the orchards of Ohio. To-day we have something like eighteen different outbreaks where it either has occurred and been exterminated, or does now occur, distributed in thirteen counties. This first announcement was three years ago, but even before that time a few young pear trees had been set out on Catawba Island, and knowing as we now do, the nature of the insect, we could readily see there were just a few small specks upon them, even smaller than fly specks. To-day, as Mr. William Miller told you, there are 15,000 trees that will either have to be cut down and burned or dealt with in some other really substantial way in an endeavor to save any of them. Out of all these outbreaks most of them are in farm orchards. Within an hour's ride of where I stand, I can take you to a country home, surrounded by its orchard of peach, pear, plum and the fruits that ordinarily grow about a farmer's premises, as well as a number of ornamental trees. A couple of infested peach trees were a few years ago introduced. The consequence is that between this and the time the trees leave out every tree, both ornamental and fruit trees, and the hedges, will have to be burned. Everything in fact save a few ornamental trees like the pine, the hemlock and others of that sort. That is the reason why this matter ought to be of special interest to you all as farmers. All over the state of Ohio there have been thousands of acres put out to orchards of fruit trees, and we are beginning to find, year after year, that some of you have got from the same source as the other orchardists this particular pest, which we know as the San Jose scale. Those of you who are interested in this can see it in the little case I have placed at the entrance. Now, we have traced this from California to the east into two nurseries, and from those two nurseries, so far as I have been able to learn, nearly every introduction into Ohio has come. It is one of those insects that are exceedingly difficult to see. It spreads perhaps by being carried upon the feet of birds, and once becoming established it multiplies with almost incomprehensible rapidity.

Now, it amounts simply to this, whether you will follow up this pest and exterminate it or quit raising fruit. Those are the two horns of the dilemma, and you will have to take one or the other. I have not magnified this. I have seen too much of it, even during the last two or three years, to attempt to do anything of that sort. Possibly some of you have seen it in California, and possibly some in Ohio, and I want to urge upon you to watch carefully and closely and be very cautious in look-

ing over your young trees that you put out from the nurseries. Nurseries that are absolutely free from this are buying their stock elsewhere, and in that way it is getting distributed over the country.

Efforts will be made between this and spring to get congress to pass a bill that shall prevent the distribution of this pest from state to state, a matter upon which states cannot legislate. Then the hope is to get uniform state legislation that will carry on the work begun by the government, because as soon as such merchandise comes into a state, national laws have no control over it, can only control it so far as it passes from one state to another. I simply want to emphasize this point. Look carefully to your orchards and be careful of whom you buy your trees.

The President: Dr. H. J. Detmers will now favor us with an address.

SWINE PLAGUE, ITS CAUSES, TREATMENT AND PREVENTION.

BY DR. H. J. DETMERS, COLUMBUS, O.

DEFINITION.

Swine-plague, also called hog-cholera, pig-typhoid, lung-fever, typhoid pneumonia, etc., is an exceedingly infectious and very fatal disease of swine, in which the morbid process, owing to the peculiarities of the pathogenic bacteria, the swine-plague bacilli, which constitute the cause, can locate in almost any part of the body, which, from one cause or another, may happen to be in an especially favorable condition for the pathogenic work of the bacilli. A few organs however, the lungs, the heart, and several lymphatic glands, though not constituting in all cases the principal, or most conspicuous seat of the morbid process, are almost invariably more or less affected.

PERIOD OF INCUBATION.

Swine-plague, like all other infectious diseases, has a distinct period of incubation; in other words, if an animal becomes infected, indications of existing sickness do not appear at once, but it will take some time, several days, until symptoms of sickness can be observed. The length of this period of incubation is not the same in different cases, and seems to depend upon the quantity of the infectious principle, or, what is the same, the number of bacilli, with which the animal has become infected, the degree of virulence possessed by these bacilli, which is by no means always the same, and the degree of predisposition, or susceptibility, possessed by the individual animals. Its duration, if the utmost extremes are excluded, varies from 3 to 15 days, and its average length may be set down as from 6 to 7 days.

THE CAUSES.

In swine-plague, as in other infectious diseases, we have to distinguish two factors or causes, both of which must be present and be acting, else no infection will take place and no morbid process will develop. We may call them the predisposing and the exciting causes. The first, the predisposing cause, or predisposition, exists within the organism of the hog, but is not of equal development in every individual animal. In some it is much stronger than in others, and in a few hogs, in about 1 or 2 per cent. of the whole number, it seems to be existing only in a very slight degree, or, perhaps, not at all, while in others, also constituting only from 1 to 2 per cent. of the whole number, it presents an exceedingly strong development, so that these animals will become infected on the least exposure to the influence of the infectious principle. If this predisposition is existing in an ordi-

nary degree, as is the case in a vast majority of hogs, it is either destroyed, exhausted or neutralized by an attack of swine-plague, from which the animal recovers, but if it is of extraordinary intensity, as it may happen to be in a few individual animals, the changes produced and left behind by such an attack, undoubtedly very much diminish such an uncommonly strong predisposition, but do not seem to be able to remove it altogether, because such hogs, if afterwards severely exposed to the influence of the infectious principle, particularly if the latter is extremely virulent, are liable to take the disease a second time, although they are not apt to become infected if the infectious principle is of ordinary virulence, or the exposure only a slight one. Between these extremes the amount of predisposition possessed by the individual animals, also considerably differs. Some of the conditions which cause these differences, are known, while others, suspected of acting as causes, have not yet been definitely proved to do so. So, for instance, it is a well-known fact that young pigs, every thing else being equal, have much more predisposition than older, or full-grown hogs, that a weak constitution, poorly developed or damaged organs of circulation and respiration, existing morbid changes produced and left behind by other previous diseases and particularly sores or lesions, external and internal, caused by parasites, by various operations, such as ringing, castration, etc., or by accident, very much increase the existing predisposition; the sores and lesions, though, probably most by offering to the infectious principle, the bacilli, an easy entrance into the animal organism.

THE EXCITING CAUSE.

Although the swine-plague bacilli, first found by me in September 1878, constitute the real and only exciting cause of swine-plague, it cannot be claimed that all the various morbid changes observed in different cases, are their exclusive work, for such is not the case. Swine-plague, in a majority of cases, at least, must be looked upon as a so-called "mixed" infection, because other bacteria besides the swine-plague bacilli, also soon find an entrance, modify existing morbid changes, and may even produce new ones, but, of course, only after the swine-plague bacilli have caused serious morbid changes in the affected parts. There are innumerable kinds of bacteria, all different, but only comparatively few of them are pathogenic (disease-producing) and able to invade, and to prey upon a living and healthy organism, just the same as there are among the plants of field and forest comparatively few that are poisonous. The great majority of the already known bacteria can only attack, and in their action are limited to dead, or severely damaged organic bodies. These bacteria, which are called saprophytes, have the very important office of splitting up complicated organic compounds into simpler ones, and thus to make them available for plant-food. Still, the line between these and the pathogenic bacteria, which, on account of drawing their sustenance from living organisms, are also called parasites, cannot be very sharply drawn, because there are numerous kinds of bacteria, which are not strictly limited to a saprophytic life on dead organic substances, but, under circumstances, are also able to exist in tissues of a living organism which are undergoing morbid changes, or have been sufficiently injured to essentially impair their vitality. This class, which for convenience may be called an intermediate one, contains a great many micrococci, or globular bacteria, and numerous bacilli or bacteria of a cylindrical form and from two to several times as long as thick. Some of these micrococci and bacilli are nearly always present wherever organic tissues have been severely damaged, or where some process of destruction is going on. In swine-plague one or more kinds of these micrococci and bacilli can almost invariably be found in the diseased parts, and more than once several of them have been mistaken and been described, even by learned men in high official position, as pathogenic bacteria and the true cause

of swine-plague. The real swine-plague bacilli present themselves under the microscope as small, short rods, about 0.5 to 0.6 of a mikron thick, and 1 mikron to 1½ mikra long (1 mikron is a trifle less than one twenty-five thousandth of an inch). To convey an approximate idea of their actual size, I will say, if they could be closely packed together, side by side, so as to leave no empty space, but without crowding them on top of each other, about 750,000,000 to 1,000,000,000 would find room within the space of a square inch. They easily and vigorously grow in suitable artificial media, for instance, in nutrient agar-agar of an alkaline reaction, but always much better on the surface than deeper down in the medium, consequently they must be looked upon as essentially a-erobic (air-requiring) bacteria. They grow almost equally well at any temperature between 15 and 40 degrees Cels. (59 and 104 degrees Fahr.), and therefore cannot be strict parasites, as has recently been claimed by a German writer, because if they were restricted to an exclusively parasitic existence, a temperature much below that of the animal body would hardly agree with them. Their vitality is something extraordinary, for I have absolute proof that colonies of swine-plague bacilli remain alive without any change in their pathogenic properties and without any loss of their power of propagation, if kept in a fluid medium, enclosed in a hermetically sealed flask, and therefore without receiving a fresh supply of pabulum and of atmospheric air, for at least three years and seven months, notwithstanding that the flasks were exposed to all degrees of temperature between 110 degrees Fahr., or more (during the summer months in a garret under a slate roof) and the freezing point. How much longer the same may be able to live under the same, or similar conditions, I do not yet know. It has also been claimed that these bacilli do not form any spores. It is true, they do not produce spores like those of *bacillus anthracis*, nor like those of the tetanus bacillus, but they surely develop formations, which, the same as the spores of the bacilli named, are able to remain a long time at rest (dormant), and then, as soon as favorable conditions are offered, proceed to develop bacilli, which multiply with great rapidity. These formations also require a very long exposure to aniline colors (carbol-fuchsin), before they accept the stain.

THE INFECTION.

The swine-plague bacilli, possessing an extraordinary tenacity of life, propagating with wonderful rapidity, being exceedingly small, and able to live in a great many media, even in water not entirely free from organic matter, have many opportunities to get an entrance into the animal organism, and thus to cause an infection. They may enter in two different ways, namely, with food and drink, and through wounds and lesions, no matter where and how small they may be. An infection through the respiratory passages will take place only, if the lining mucous membrane contains lesions, or is in places denuded from epithelium, but not otherwise. As frequent vehicles, or carriers, of the infectious principle, the swine-plague bacilli, conveying the same from one place to another, and thus effecting a spreading of the disease, I will mention: (1.) Contaminated water. (2.) Contaminated food. (3.) Dung, other excretions and secretions of diseased animals, and all kinds of infected substances, which are dried and powdered by wind and weather to dust, as such carried through the air by the wind, and deposited on food and drink, and in wounds and lesions. In the latter, in which the dust will stick to the exudating surface, the bacilli find all the conditions necessary, not only to propagate, but also to be carried into the organism by the veins and lymphatics. (4.) Insects of various kinds, but especially flies, which flying from one animal to another, often bring about an infection by lighting down on a healthy animal after they have been feasting on a diseased one, or on a carcass. The infectious principle also can be, and often is, carried from one place to another one by men, especially on their clothes and footwear, by various animals, but particularly

by dogs, rats, cats, barnyard fowls, buzzards, etc., especially if they have been feasting on the carcass of an animal that has died of swine-plague, and carry parts of the same into yards or fields, occupied by healthy hogs. (5.) Inanimate things, such as wagons, carts, straw used for bedding, etc., may also serve as means of conveying the infectious principle from one place to another, and thus become a mediate cause of a further spreading of the disease. In many cases the infectious principle is preserved in accumulations of straw, hay, fodder, rubbish of any kind, etc., which, once infected, and not promptly destroyed, will be a source of danger for a long time, possibly for a year or more. As a frequent source of infection, must be considered an infected straw-stack accessible to hogs, because being porous and retaining moisture, it constitutes the most admirable means for the preservation of the swine-plague bacilli. Further, in former years considerable spreading of the disease has been caused, especially in the western states, by permitting diseased hogs to run at large, to have access to water accessible to healthy animals, and to be transported from one place to another, but still more by not compelling the owners of diseased hogs to promptly disinfect and to bury sufficiently deep or cremate the dead ones, instead of permitting them to pile the carcasses in a heap until there were enough to make a wagon-load, and then to have them hauled over the public roads to one of the numerous rendering tanks. I do not know whether this most pernicious practice has been stopped or not, but I do know that it has contributed more than anything else in spreading the disease broadcast over the whole country.

THE WORKING OF THE SWINE-PLAGUE BACILLI.

Pathogenic bacteria can act in three different ways: 1. Mechanically. The bacteria acting in this way have a rapid propagation, and with their great numbers soon fill and clog the capillary vessels, and thus obstruct the circulation. As a necessary consequence, the process of nutrition in the affected part, or parts, is interfered with and caused to become morbid, often to such an extent as to endanger not only the vitality of the diseased parts, but also the life of the whole organism. *Bacillus anthracis* may serve as an illustration. 2. By withdrawing from the animal organism some indispensable elements, without which physiological processes of vital importance cannot go on, and therefore necessary to life. As such an element I will mention the oxygen of the blood, and as an example again the action of *bacillus anthracis*. 3. By causing a production of substances, usually called toxins, or toxalbumines, which, like a good many alkaloids, are poisonous to the animal organism. As mentioned before, bacteria split up complicated organic compounds into simpler ones, and then the products of this splitting process frequently form new combinations, entirely different from those originally existing. If this splitting process takes place in a living organism, often one or more of these new compounds are poisonous to the organism in which they have been produced, and the bacteria, which caused the process, and therefore must be considered as the originators of these poisonous substances, become in this way pathogenic, or disease-producing. Still, different kinds of bacteria do not act alike, and the toxins, which are formed as a result of their action, very much differ in their effect upon the animal organism. But the activity of the same kind of bacteria, it seems, always results in producing the same kind of poisonous substance. To illustrate: the *bacillus* of tetanus (lock-jaw) causes the production of a toxine, which, in its effect upon the animal organism, closely resembles the well-known alkaloid of nuxvomica, strychnine; the bacterium of parturient paralysis of cows causes the production of a toxine, which has a decidedly paralyzing effect, and the "comma" bacillus, the cause of Asiatic cholera, effects the production of a toxine, which is considered as the immediate cause of all the principal phenomena of that disease.

The swine-plague bacillus, *bacillus suis*, acts mainly in two, and, to a limited extent, in all three ways. 1. It acts mechanically [by clogging the capillary vessels with its fast numbers; 2, it causes the production of a toxine, which it seems, has an injurious effect upon the walls of the capillaries, and 3, it probably withdraws some oxygen from the blood. Especially the first named action explains the peculiarities of the morbid process, which, in the beginning presents all the features of congestion, followed by exudation and even extravasation of blood (the latter particularly in young pigs with tender capillaries and a comparatively weak heart), and then by a neoplastic process, resulting in a formation of new, morbid tissue of low vitality, and therefore easily succumbing to a process of decay, which soon follows, and, wherever the circulation in the capillaries is almost entirely interrupted, often progresses more rapidly than the neoplastic process, and then extends its destructive action to normal tissues. This action fully explains why the morbid process preferably locates in parts, which, at the time of infection, or during the period of incubation, are more or less congested, either in consequence of existing wounds or lesions, bruises, etc., or from other causes. In congested parts the capillaries contain an abnormal quantity of blood, and this, combined with the retarded and irregular circulation, probably constitutes the cause of the accumulation of the swine-plague bacilli in the congested parts, in which they find at the same time, conditions most favorable to their propagation and the exercise of their pathogenic properties. It also shows why the morbid process of swine-plague is capable of devolving in almost any part of the body. So, for instance, in animals, which have recently been ringed, the morbid process, almost invariably, will cause destruction in the wounded nose; in animals, recently castrated, morbid changes will be produced in the scrotum and spermatic cords; in animals with accidental lesions between the toes, morbid changes will appear there, and in suckling sows, which are wounded by their pigs when fighting for a teat, the wounds will soon present all the characteristics of the morbid process of swine-plague. In short, every existing wound will attract the morbid process of swine-plague after an infection has taken place.

The lungs and certain lymphatic glands, almost without exception, become more or less affected in every case of swine-plague, because in the lungs the bacilli, which have entered the organism through capillary veins in bonds or lesions, will find the first capillary system, and it is very safe to say that by far the most infections occur through wounds or lesions in either skin or mucous membrane. In the same way the bacilli, which enter through the lymphatics, find something analogous to a capillary system in the lymphatic glands, and wherever the bacilli finds an entrance through the capillary veins, they nearly always have also a chance to find an ingress through the lymphatics, and vice versa. Therefore, that form of swine-plague, in which the morbid process has its principal seat in the lungs, and in which the most conspicuous symptoms are those of lung fever (pneumonia), is really the most typical form of the disease.

TREATMENT.

As far as medicinal treatment is concerned, it can have no direct effect upon the cause of the disease, the swine-plague bacilli, because the latter, once within the tissues of the animal organism, are inaccessible to the effect of medicines; at any rate, cannot be destroyed, or be removed, without fatal results to the animal itself. Whether anything practical can be accomplished by the new serum treatment or not, is extremely doubtful, and even if the same should prove to be effective in some cases, it can be so only, if applied during the very first stage of the disease.

Besides this, it would be out of the question to apply it to the thousands, or rather millions, of swine every year diseased with swine-plague, because, if not absolutely impossible, it would prove to be too expensive to obtain, just when needed, sufficient quantities of reliable serum, and to find enough skilled men to apply it. Used as a preventive in a somewhat similar swine disease, it has, according to German reports, utterly failed to protect any longer than two or three weeks. Further, in all such cases in which the morbid process has made sufficient progress to cause irreparable degeneration or destruction, or in which vital organs have become affected to such an extent that morbid changes, not only of a temporary, but also of a more or less permanent character, and sufficient to seriously interfere with the performance of the normal functions of these organs, will be the consequence, a perfect recovery is out of the question, and where a perfect, or nearly perfect, recovery is excluded, the greatest favor a hog, diseased with swine-plague can do its owner, is to die as soon as possible, because if remaining alive, it will never again pay for its board. If the morbid process is limited to the lungs, as is sometimes the case, and the morbid changes do not extend beyond one-half of the lung tissue, the sick hog may survive, and although a restoration to perfect health will not take place, the fattening qualities may not be impaired. If the morbid changes in the lungs are more extensive, or if the more vital organs, heart and brain, are seriously affected, the animal, as a rule, will die. The termination of the disease also will be a fatal one if the morbid process, though not seriously affecting the most vital organs, is very extensive or very destructive, in other parts of the body, for instance, in the digestive apparatus. Where this is not the case, but the digestive organs, the mesenteric glands included, as it frequently happens, are permanently injured, the process of digestion will be defective, and either only a part of the consumed food will be digested, or sufficient appetite will be wanting, and if a large number of the mesenteric and other lymphatic glands have become degenerated, the partially recovered animal may eat and digest a sufficient quantity of food, but the assimilation will be inadequate and the process of nutrition will be defective, so that such an animal, though consuming large quantities of good food, will not grow and fatten, but emaciate and decline.

The only rational treatment, applicable in all cases, consists in: 1(1) Preventing as much as possible any further invasion of swine-plague bacilli and other bacteria by isolating the sick animals, by disinfecting the infected premises, by keeping the same as clean as it can be done, and by obviating thus any consumption of excrements and any contamination of food and drink. (2) Giving clean and sound food to eat, but no more at a time, than will be consumed at one meal, and pure water, perhaps a trifle acidulated with some acid, to drink. (3) Protection against inclement weather and against the rays of a hot sun, if the diseased animals are kept out doors, and if kept under roof, good ventilation, so as to provide pure air to breathe, and protection against flies in the fly season.

In special cases a little, but a little only, may be accomplished by medication. So, for instance, good results have been observed from the effect of an emetic, provided it is given while the disease is yet in its first, or incipient, stage. Later it can do no good. The best emetic for hogs is white hellebore, and the dose is from 2 to 20 grains, according to the age and size of the animal. The easiest method to give it is to mix the powder with a piece of boiled potato and then to offer it for voluntary consumption. If the patient should not vomit in 20 minutes, the dose must be repeated. In cases of swine-plague, in which constipation is one of the first and principal symptoms, a good physic is indicated. As such, calomel in most cases is to be preferred. Dose and method of giving it are the same as of white hellebore, but a second dose must not be given within 10 or 12 hours. In some cases, in which constipation constituted one of the main symptoms, I have observed good results from hyposulphate of soda. It is best given with the food, or dissolved in the water for drinking, and

the dose, which is from one-half drachm to four drachms, may be repeated once every six hours until the animal perishes. Hogs should, under no circumstances, be drenched, because if it is done and force is used, it will make a dead hog nine times out of ten. In those cases, in which the principal seat of the morbid process is on the surface of the body, and therefore accessible, a great deal more can be done. Such cases, after all decayed tissue has been removed, can successfully be treated with antiseptics. Among them we may take our choice, according to circumstances, between nitrate of silver (if small amounts of tissue have to be destroyed), solutions of pure carbolic acid, or of creolin, in various strengths (in most cases a 2 to 5 per cent. solution will suffice), iodoform and several other antiseptics. Any treatment, no matter what it may be, will seldom be of any avail in all those cases in which the disease has its principal seat in internal parts, and has far enough progressed to cause serious morbid changes. The sooner such animals die the better it will be for the owner.

DISINFECTION.

Wherever swine-plague is, or has been, prevailing, it is very essential to promptly clean and disinfect the yards, pens, feeding and watering troughs and every thing else that may have become contaminated with the infectious principle, because doing this will not only prevent a continuous invasion of the swine-plague bacilli into the organisms of the animals already diseased, but will also, more than anything else, arrest a further spreading of the disease from animal to animal and from herd to herd. For every thing that is dry and clean and can be exposed to them, dry air and sunlight, are the best and cheapest disinfectants known, except in cases in which their action is not quick enough. For things which can not be exposed to the action of sunlight and dry air, or where a more rapid disinfection is required, perhaps nothing is more effective, easier applied and cheaper, than a one permille solution of corrosive sublimate in rain water. The next best, probably, is chloride of lime. When pens, yards, etc., are cleaned to be afterwards disinfected, all litter, corncocks, decayed wood, manure and all kinds of rubbish must be burned. If this is neglected, all these things will be a source of great danger for a long time. If the disease has made its appearance in a herd, all animals, apparently yet healthy, should immediately be separated and be removed to a noninfected place, and, if possible, to high and dry ground, or at least to ground that does not receive any drainage from any place possibly infected. After such a separation has been made, the wants of the separated animals should be attended to by a person, who does not only not come in contact with the diseased hogs, but who also avoids coming near them, and persons and animals, who come in contact with the sick hogs, or with any thing that may have become contaminated with the infectious principle, must keep away from the separated animals. The separation must be a complete one. That the apparently healthy animals, thus separated, must be closely watched, and that any one of them, if showing the slightest indication of being probably diseased, must at once be removed, will not require any argument. Neither will it need any explanation why the separated and apparently healthy hogs must not be wounded and receive anything to eat and to drink, but what is perfectly clean and not contaminated with the infectious principle.

MEASURES OF PREVENTION.

Swine-plague, like most infectious diseases, can be prevented in two different ways, namely: (1) By removing, destroying or warding off the exciting cause, the swine-plague bacilli. (2) By acting upon or preparing, the individual animals in such a way as will enable them to resist the action of the swine-plague bacilli, so that the latter will have no pathogenic effect upon them; in other words, by destroying their predisposition and thus making them immune, or exempt, from an attack of the disease.

The first way, wherever possible, is the most radical and the surest, but as swine-plague is a disease, which, originally imported from Europe, has been permitted to spread over the whole country, from the Atlantic to the Pacific, and is caused by a bacillus, which is not restricted to an exclusively parasitic life, some insurmountable difficulties are met with. The swine-plague bacilli are not only exceedingly small, and multiply with great rapidity, but also possess such a wonderful vitality that they are able to exist for a long time, probably for years, on and in almost anything that retains moisture and protects them against the influences of dry air and sunlight; hence, it is impossible to find and to know all the places where they may be lurking, and as long as we do not know where they are, we cannot destroy them, unless it is done by accident. (2). Even if a locality, a farm, for instance, should be reliably disinfected, and be known to be so, there are abundant opportunities for the bacilli to be re-introduced, not only by human beings and various animals, such as dogs, buzzards, flies, etc., but also by innumerable inanimate things, which can become the carriers of the same. The fact that the disease has gained such a universal foothold and that no effective measures are taken to restrict its spreading, vastly augments the existing danger. One of the principal sources of the propagation of swine-plague consists in a contamination and infection of small creeks, streamlets and runs of water by diseased hogs being allowed to have access to them. This source and several others, at any rate, could be easily closed, if everyone who has swine-plague on his place, would be compelled to keep his sick and infected animals penned up, and to bury, or cremate, the dead ones in a thorough manner and on his own premises. The difficulties, just mentioned, are only the principal ones, but they are more than enough to make it practically impossible to reliably protect a herd of swine, even if the same is kept strictly isolated on non-infected ground.

The second method of protection, which is much less difficult, consists in producing immunity from swine-plague by destroying the predisposition or susceptibility of the individual animals. It has been known a long time that an animal which has had an attack of swine-plague, and has recovered, very seldom contracts the disease a second time, no matter how much the same may be exposed to an infection. The first attack, therefore, has produced immunity, or, in other words, has destroyed the existing predisposition. Only in a comparatively small number of hogs, on an average in about one or two out of a hundred, the natural predisposition, it seems, is too strong to be entirely wiped out by the effect of one attack, so that just enough may remain to bring about a second infection, if such an animal is severely exposed to the influence of the infectious principle, especially if the same is as extraordinarily virulent as it was in 1878, and as it is now, and has been in the summer and fall of 1896. In years in which the infectious principle is of ordinary virulence, a second attack is exceedingly rare, and if it does occur, is usually very mild. It has further been observed that a very mild attack, even if too lenient to cause any plain symptoms and any injury to the affected animal, is just as effective in destroying the existing predisposition as a severe one. In my researches into the nature of swine-plague I also found that an attack brought on by inoculation, no matter whether mild or severe, likewise causes immunity as well from the consequences of a natural infection as of an artificial inoculation. Then, by further experimentation, I discovered reliable means to reduce the pathogenic properties of the swine-plague bacilli to almost any desired degree, and thereby became enabled to produce by inoculation an invariably mild attack of swine-plague, which hardly ever manifests its presence by any observable symptom, consisting in a slight loss of appetite, lasting only one day, and never causes any injury to the inoculated animal, but gives it the same immunity as a more or less severe attack following a natural infection. That such is the case has been verified by numerous experiments, first in the laboratory on rabbits and pigs purchased for that purpose, and then in

the field. The pigs inoculated in the laboratory were afterwards exposed to a natural infection in every possible manner, and every one of them proved to be perfectly immune. The rabbits, likewise, proved to be fully protected, at any rate, after an inoculation with very mild material, no inoculation with virulent material was able to give them an attack of the disease, notwithstanding that rabbits are even more susceptible than pigs, and become infected and succumb much sooner. The field experiments, made on fully 2,000 head of swine of all ages, and belonging to herds distributed over seven counties and two states, had in every case, in which no serious mistake had been made, the same result. These experiments were begun in 1891 and continued until the end of 1892. At first there was some apprehension that the artificially mitigated pathogenic properties of the swine-plague bacilli, in some way, or under favorable conditions, might be restored to their former virulence. This question, too, has been solved by numerous carefully conducted experiments, by which it has been proved beyond any doubt that such a restoration will not take place, and also that an inoculated animal is not able to infect a healthy one, and cannot become a source of communicating, or spreading the disease. Furthermore, it has been demonstrated by experiments that even the most careless handling and spilling of the inoculation material will not cause any infection of a young rabbit, an animal possessing much more predisposition than a pig.

Knowing that a great many people cannot distinguish between prevention and cure, and cannot cut loose from the idea that anything that prevents a disease must also be able to cure the same, I have concluded not to put the inoculation material on the market, nor to give it into the hands of everyone who asks for it, but have entrusted it only to a few trained and reliable men, who have from the first of June to the first of December 1896, inoculated over 12,000 head of swine. As the inoculation is not a cure, has no effect upon, and is not applicable to already diseased, or infected animals, and further, as the immunity caused by the inoculation does not exist as soon as the latter has been performed, but requires for its development, which is a gradual one, about twelve days, mistakes are possible and are easily made. Therefore, to guard against them as much as is within my power, I have so far, only selected a few assistants, to whom I have exclusively entrusted the performance of the inoculations. Still, in spite of these precautions, some mistakes have been made. A few already infected herds, in which the disease was in the state of incubation, and therefore not yet attended with any symptoms indicating the presence of swine-plague, have been inoculated upon the assurance of the owners that their hogs never had been exposed and had not become infected. The result has been that some animals, and in one case, the majority of the herd, soon presented plain symptoms of swine-plague. In a few cases, also, one or more of the inoculated animals, probably not infected previous to the inoculation, have been reported as having become diseased. Some of these animals, which showed plain symptoms within three or four weeks after the inoculation, undoubtedly became affected before the immunity was complete, or within twelve days after the inoculation, but at a time at which the predisposition was already sufficiently diminished to lengthen the period of incubation. The others, which showed the first symptoms of sickness later than four weeks after the inoculation, are very few in number, surely not exceeding one per cent. of the whole number inoculated, and were animals which possessed an uncommonly strong predisposition, too strong to be completely removed by the effect of either an inoculation or a natural attack, and undoubtedly were severely exposed to the influence of the, at present, extremely virulent infectious principle. These few animals, therefore, cannot disprove the efficiency of the protection resulting from the inoculation. In exceptional cases vaccination against smallpox also fails to prevent an infection. It is possible, though, to produce immunity from swine-plague in every animal by subjecting the same to a second inoculation, to be made from two to three weeks later than the first, but as nobody is

able to pick out the few animals having such a strong predisposition that it cannot be removed by one inoculation, the whole herd would have to be inoculated twice, and to do that is hardly worth the trouble. One thing is sure, the protective inoculation, as applied by my assistants and myself, is not only the easiest and the simplest, but also the most rational, the most reliable and the cheapest means of stopping the ravages of swine-plague. At any rate, if no mistakes are made by inoculating diseased or infected animals, and if the inoculated animals are not exposed to an infection within the first twelve days after the inoculation, at least from 98 to 99 per cent. of the whole number of the animals inoculated will be fully protected.

The President: The next subject on the program is an address by Hon. J. H. Brigham Ex-President of the State Board of Agriculture.

THE FARMER'S SHARE.

BY COL. J. H. BRIGHAM, DELTA, O.

In making a claim to a fair share of the good things of life for the farmer, I have no reflections to cast upon those who seem to be more prosperous than he is; I do not wish to enter upon a tirade against those who have won success in any honorable calling, but I do desire to inspire the farmer to such a degree that he will do all that he can do legitimately to secure for himself and his family and his class all that rightfully belongs to him or them. Before making any claim however, it may be well to see what the farmer has done for his country and mankind.

The men who braved the dangers of the deep to find a home on the eastern shore of the continent of America were farmers. They endured all the hardships and faced all the dangers incident to pioneer life with a heroism seldom equaled. The first winter this brave little band laid to rest in the frozen soil of the Atlantic coast, one-half of their number; but when the sails of the ship which brought them across the sea were unfurled to return to the old home with all its associations, none of that heroic band deserted the graves of their dead or abandoned their lofty purpose to build homes where they could worship God according to the dictates of their own consciences. From that time to the present, the farmers have been the men to go out into the wilderness and open the way for those who were to come after and enjoy the fruits of their toil and sacrifice.

As pioneers the farmers have performed their full share of work necessary to change the wilderness into the prosperous land that it appears to be to-day. When the time came that it seemed necessary to separate from the mother country and establish a new form of government, the farmers were first and foremost in that terrible struggle for freedom. It was "the farmers of Lexington who fired the shot which rang around the world." When the victory was won and the world realized that a new nation had been born, the farmers came together to help lay the foundation of a republic. No one questioned their right, or doubted their ability to participate in this important work; it was so well performed that our government stands more secure on its broad foundation than that of any other country in the world.

The people were impoverished by the war, and the government had no money or credit, but these brave farmers were industrious and skillful and gathered from the brown soil the stored wealth of ages and soon convinced the world that the infant republic was destined to become famous for its wealth. Surely the farmers contributed their full share as wealth producers.

As taxpayers the farmers have always borne their full share and more of the burdens of government. As conservators of the peace, the farmers have never failed to uphold the law in the community in which they live. All this and more may truthfully be told of the old-time farmers.

When a portion of our people sought to destroy the government, the first to respond to the call for help were the brave boys from the farm homes of our country, and in all the years of desperate warfare every man engaged in the struggle will testify to the fact, that there were no braver, no truer patriots than those farmer soldiers of the Republic. When victory crowned their efforts, they returned to the farms well knowing that an enormous debt had been incurred in the struggle for existence as a nation; they soon brought from their farms the wherewith to pay off a large portion of this debt and reestablish the financial standing of the United States. As wealth producers and credit restorers the farmers have rendered important service. To-day all intelligent men recognize the fact that the prosperity of the nation is dependent upon the success of the farmers in tilling the soil.

I believe that I have laid the foundation for making some claims for the farmers. I ask for them a fair share of the wealth which they produce; that they do not receive it is acknowledged by every intelligent man, and I do not need to enter into an argument to prove what is generally admitted.

I claim for the patriotic farmers a fair share of recognition when honors are being distributed. It is desirable to keep some of our ambitious boys upon the farm, but we cannot do so if we allow our farmer classes to be ignored in the future as they have been in the past.

The farmer classes should be fairly represented in the law making bodies of state and nation; without such representation their interests will be neglected and they will suffer from unjust and discriminating laws.

The farmers should have a full share of social culture and enjoyment. They should share in the educational advantages and training which prepare men for success in life and for the responsible duties of citizenship. How can the farmers secure for themselves and their families these privileges and advantages which rightfully belong to them? There is only one way. They must organize their forces and go to work systematically and persistently for this purpose or there is no help for them. "The Lord helps those who help themselves," but the Lord will never do for any man what he can do for himself. There is no human power strong enough to oppress and rob the farmers of a fair share of their earnings or honors, if they will make available the power of the millions engaged in tilling the soil.

Will the farmers of to-day by proper and legitimate means secure to themselves and their children what is surely theirs by right, or will they continue to allow others by organized methods to rob them of their just share of the rewards of their labor and patriotic service and leave to their children a heritage of wrong? Time alone can answer. I earnestly urge you to give careful attention to present conditions and those that are threatening to make it still harder for the farmers in the future, and trust that God may give you courage and strength to do your whole duty in the most effective manner.

I thank you for your attention.

The report of the Committee on Resolutions was then called for by the President, and Mr. F. A. Derthick, chairman, reported as follows:

Mr. President:

We, your Committee on Resolutions, beg leave to submit the following.

WHEREAS, The Bureau of Animal Industry was established for the study of diseases of domestic animals, and to devise means and make regulations for quarantine and traffic in live stock, and

WHEREAS, The Bureau has practically limited the advance of Texas fever beyond its normal line, and had effectually stamped out pleuro-pneumonia, and

WHEREAS, The swine plague or hog cholera continues to spread into new territory, and the loss from this disease alone is heavy on our productive interests and lessens our annual exports and the legitimate rewards of the farmers and stock feeders,

Resolved, That the farmers and stockmen of Ohio in Convention assembled, do urge upon the Bureau to give such attention to the causes of this disease and means of restraint as may bring relief to the swine industry.

WHEREAS, The farmers and stockmen of Ohio recognize that the Bureau of animal industry in checking the spread of Texas fever and stamping out pleuropneumonia in the United States has done a great work, and it is but a harbinger of the possible value the untrammelled efforts of the Bureau may have in the protection of our flocks and herds, and

WHEREAS, The Humane Society of the City of Washington has in Senate bill 1552, a bill intended to prevent tests or experiments on living animals, such as the horse, ox, sheep, pig and kindred subjects, therefore

Resolved, That the farmers and stockmen of Ohio in Convention assembled do protest against the passage of Senate Bill 1552, and at the same time call on our Senators and Representatives to prevent if possible the passage of a bill so obstructive to the interests of scientists, agriculturists and stock farmers.

WHEREAS, The San Jose scale has been and is likely to be still further distributed over the state of Ohio on nursery stock, therefore be it

Resolved, That it is the sense of this Convention that Congress should enact such laws as will tend to prevent the distribution of this pest through interstate commerce, and that states should enact such uniform supplementary laws as will eradicate the pest where it has already become established.

INASMUCH as these annual state agricultural meetings are of an educational nature, devoted to the promotion of the material interests of the state, and the delegates and members attending contribute their time and labor for the public good, and inasmuch as the depression of the times bears most heavily on agricultural interests and reduces the ability of farmers to meet these expenses, therefore

Resolved, That the various railroads of the state are urgently requested to make an arrangement for half fare to all delegates and members attending these annual meetings.

Resolved, That this Convention indorses the establishment of a thorough system of state meat inspection, similar to that successfully in operation in Germany and other countries.

WHEREAS, The Department of Agriculture was created for the purpose of promoting the interests of the farmers of this country, and was raised to a cabinet rank in order to more completely serve this purpose as well as to add dignity to the profession of agriculture; and as the functions of the Department are largely economic, not political nor governmental; and as the vital objects of the Department cannot possibly be accomplished when it is controlled and directed by one who does not thoroughly understand what ought to be done and is not in thorough sympathy with those objects by education, life work and association; and as the desires of farmers in regard to the selection of this cabinet position have been disregarded hitherto, therefore

Resolved, That this Agricultural Convention of the State of Ohio respectfully but urgently request President-elect McKinley to appoint for Secretary of Agriculture a practical farmer—a man who is of the class he is to represent—one who thoroughly understands the agricultural situation in every portion of this country and will labor zealously for the promotion of this great foundation industry.

Resolved, That the Hon. J. H. Brigham, of Ohio, is the most available man who has yet been proposed for this position, and his appointment would be national in its character and would command the confidence and respect of farmers in every

state in the Union, as demonstrated by the almost unanimous support he has received from every section of the country, and we therefore urge his appointment.

Resolved, That the Secretary of the State Board of Agriculture be instructed to forward a copy of these resolutions to President-elect McKinley.

F. A. DERTHICK,
J. T. ROBINSON,
E. W. PORTER,
Committee.

And thereupon, on motion, the Convention recessed until seven o'clock P. M. of the same day.

EVENING SESSION.

At 7 o'clock P. M., President Bower called the Convention to order and announced the regular order of business to be the election of five members of the State Board of Agriculture. Mr. George W. Carey, of Warren county, and Mr. V. D. Craig, of Guernsey county, were appointed tellers; and on the first ballot the following gentlemen were duly elected to membership of the Board for the term of two years: J. C. Bower, of Franklin county; A. J. Clark, of Guernsey county; E. C. Ellis, of Hamilton county; Chester Bordwell, of Clermont county; J. S. Stuckey, of Van Wert county.

And thereupon the Convention adjourned.

SEVENTH ANNUAL REPORT
OF
FARMERS' INSTITUTES

HELD IN OHIO IN 1896-97,

UNDER THE AUSPICES OF THE

Ohio State Board of Agriculture,

AND

Proceedings of the State Farmers' Institute,
Held in Columbus, January
12 and 13, 1897.

NORWALK, OHIO.
THE LANING PRINTING COMPANY,
1897.

SEVENTH ANNUAL REPORT
OF
FARMERS' INSTITUTES

Held in Ohio During the Winter
of 1896-1897.

The Farmers' Institute season of 1896-97 opened Monday, November 30, continued thirteen weeks, and closed Saturday, February 27, 1897. During this period there were held two hundred and twelve (212) regular county institutes and one state institute under the auspices and general management of the State Board of Agriculture. Many independent farmers' institutes were held in the state during the same period, but of these only twenty-five societies made formal reports to the Department of Agriculture.

Two hundred and eleven (211) county institutes were established by the State Board of Agriculture at a regular meeting of the Board, held in Columbus September 25, 1896, and the speakers or institute lecturers were selected by the Board at the same time. The two hundred and twelfth institute was established later on petition of the progressive farmers of Jackson county; so that now all the counties in the state are properly and satisfactorily organized with from one to six farmers' institute societies.

The farmers' institutes in the state are improving annually in attendance, interest and valuable work accomplished. Petitions praying for the recognition of additional institutes, to be conducted under the control and management of the Board, are being received by the Secretary of the Board in increasing numbers; these are all being filed for the consideration of the Board at a meeting to be held for that purpose in September next.

Because of the very wise and liberal action of the legislature in enacting the "Cromley amendment" to the farmers' institute law, on April 27, 1896, the Board was enabled to materially increase the number of institutes held during the last past institute season, the increase being fifty-five (55) two-day institutes over the greatest number ever before held in the state, which was one hundred and fifty-seven (157) in 1895-96.

The Board feels satisfied that the maximum number of institutes held in a season has not yet been reached and it hopes to considerably increase the number next winter, believing that by this means an increasing amount of good will be accomplished for the agriculturists of the state.

The state institute held in the city of Columbus January 12-13 last, was most satisfactory and successful in every respect; it had a considerably larger attendance of progressive farmers from all parts of the state than any state institute previously held, and the interest manifested was all that the Board and the many friends of the institute could desire.

Agreeable to the provisions of section 6 of the "Law governing Farmers' Institute Societies in Ohio," the Board publishes herewith "such lectures and papers delivered at the several institute meetings as may seem of general interest and importance to the farmers, stock breeders and horticulturists of the state," and "a detailed statement of its receipts under the provisions of this act and the disbursements on account of institute work."

State and local speakers responded nobly to the request of the Board to have papers forwarded to the Secretary of the Board for reference to the publication committee for approval with a view to publication, and the result was that very many meritorious manuscripts were received that could not possibly be used because of lack of space in this pamphlet.

The Board feels greatly encouraged in its farmers' institute work and is disposed to continue its efforts in the enlargement and improvement of the inviting field.

By direction of the State Board of Agriculture.

WELLS W. MILLER,
Secretary.

COLUMBUS, O., April 1, 1897.

FINANCIAL STATEMENT.

The following statement shows the receipts and disbursements of the Ohio State Board of Agriculture on account of Farmers' Institutes, for the season of 1896-1897, held under the law passed April 26, 1890, and amended April 27, 1896.

RECEIPTS.

Amounts collected from the counties on the basis of three mills per capita, being the State Board's proportion of the six mills per capita allowance provided by the law for the maintenance and support of county institute societies in Ohio:

Adams County.....	\$78 27
Allen County.....	121 93
Ashland County.....	66 66
Ashtabula County.....	125 00
Athens County.....	105 58
Auglaize County.....	84 30
Belmont County.....	125 00
Brown County.....	89 69
Butler County.....	125 00
Carroll County.....	52 69
Champaign County.....	80 94
Clark County.....	125 00
Clermont County.....	100 65
Clinton County.....	72 72
Columbiana County.....	125 00
Coshocton County.....	80 10
Crawford County.....	95 78
Cuyahoga County.....	125 00
Darke County.....	125 00
Defiance County.....	77 30
Delaware County.....	81 56
Erie County.....	106 38
Fairfield County.....	101 81
Fayette County.....	66 92
Franklin County.....	125 00
Fulton County.....	66 06
Gallia County.....	81 01
Geauga County.....	40 46
Greene County.....	89 46
Guernsey County.....	85 92
Hamilton County.....	125 00
Hancock County.....	125 00
Hardin County.....	86 81
Harrison County.....	62 49
Henry County.....	75 24
Highland County.....	87 14
Hocking County.....	67 97

Holmes County.....	63	41
Huron County.....	95	84
Jackson County.....	85	22
Jefferson County.....	118	24
Knox County.....	82	80
Lake County.....	54	70
Lawrence County.....	118	66
Licking County.....	125	00
Logan County.....	82	15
Lorain County.....	120	88
Lucas County.....	125	00
Madison County.....	60	17
Mahoning County.....	125	00
Marion County.....	74	18
Medina County.....	65	22
Meigs County.....	89	43
Mercer County.....	81	66
Miami County.....	119	26
Monroe County.....	75	52
Montgomery County.....	125	00
Morgan County.....	57	42
Morrow County.....	54	36
Muskingum County.....	125	00
Noble County.....	62	25
Ottawa County.....	62	92
Paulding County.....	77	79
Perry County.....	93	45
Pickaway County, allowance \$80.87, interest on same, 55.....	81	42
Pike County.....	52	44
Portage County.....	83	60
Preble County.....	70	26
Putnam County.....	90	56
Richland County.....	114	21
Ross County.....	118	36
Sandusky County.....	91	85
Scioto County.....	106	13
Seneca County.....	122	60
Shelby County.....	74	12
Stark County.....	125	00
Summit County.....	125	00
Trumbull County.....	125	00
Tuscarawas County.....	125	00
Union County.....	68	58
Van Wert County.....	89	01
Vinton County.....	48	13
Warren County.....	76	40
Washington County.....	125	00
Wayne County.....	117	01
Williams County.....	74	69
Wood County.....	125	00
Wyandot County.....	65	16
Collected from Hamilton County for 1895-6.....	\$80	00
Interest on above.....	1	64
Total.....	\$8,252 54	

DISBURSEMENTS.

For per diem and expense of lecturers as follows :

Begg, John, Columbus Grove, four weeks and four days.....	\$219 10
Brigham, J. H., Delta, nine weeks.....	419 55
Brown, W. F., Oxford, three weeks.....	155 20
Burkett, C. W., Columbus (no per diem), two weeks and two days...	48 30
Cowden, W. N., Quaker City, four weeks.....	185 15
Derthick, F. A., Mantua, eight weeks and four days.....	408 93
Ellis, S. H., Springboro, eight weeks and four days	439 99
Elliott, E. E., Morning Sun, five weeks.....	243 50
Farnsworth, W. W., Waterville, five weeks and four days	248 79
Foreman, H. M., Waterford, four weeks.....	201 10
Freeman, C. M., Rex, three weeks and four days.....	177 00
Gibbs, W. D., Columbus (no per diem), two weeks.....	41 25
Green, W. J., Wooster (no per diem), two weeks.....	36 85
Greene, J. F., Sandusky, seven weeks.....	338 80
Hickman, J. F., Wooster (no per diem), two weeks	37 95
Hunt, Thos. F., Columbus (no per diem), two weeks	35 35
Hurst, S. H., Chillicothe, four weeks and four days	236 50
Kellerman, W. A., Columbus (no per diem), two weeks	31 40
Lawrence, G. E., Marion, four weeks and four days.....	217 00
Laylin, T. C., Norwalk, five weeks.....	242 08
Lazenby, W. R., Columbus (no per diem), two weeks	27 75
Longenecker, T. F., Dayton, four weeks and four days.....	239 35
Lyon, C. D., Higginsport, three weeks.....	136 95
McLaughlin, S. K., Hurford, four weeks	217 00
Roudebush, J. L., Stone Lick, three weeks.....	135 10
Scott, Geo. E., Mt. Pleasant, five weeks.. ..	265 60
Selby, A. D., Wooster (no per diem), two weeks	29 84
Shawver, J. L., Bellefontaine, four weeks and four days.....	219 00
Thorne, C. E., Wooster (no per diem), two weeks.....	35 50
Todd, S. H., Wakeman, nine weeks.....	415 76
Vine, O. J., Canton, three weeks	126 65
Webster, F. M., Wooster (no per diem), two weeks.....	65 35
White, D. S., Columbus (no per diem), one week	15 15
Williams, C. G., Gustavus, six weeks.....	314 02
	<hr/>
	\$6,206 81

MISCELLANEOUS.

For expenses of lecturers, reporting, printing, etc., for State Farmers' Institute held at Columbus, January 13-14	\$255 47
On account of preparing report for printer, job printing, postage, express, etc.....	1,790 26
	<hr/>
Total	\$8,252 54

FARMERS' INSTITUTES HELD IN OHIO DURING THE SEASON BEGINNING NOV. 30, 1896, AND ENDING FEB. 27, 1897.

Counties.	Population.	Institutes held.		Attendance reported.	Local expense reported by society.	Per capita allowance to institute societies under the Institute law.
		Where.	When.			
Adams	26,083	Cherry Fork.....	January 1, 2.....	400	\$24 00	\$78 27
Allen	40,644	Harrod.....	February 1, 2.....	300	39 00	121 93
		Spencerville.....	February 3, 4.....	300	35 85	.....
Ashland	22,223	Beaver Dam.....	February 15, 16.....	450	32 98	.....
		Loudonville.....	December 2, 3.....	270	30 32	66 66
Ashtabula	43,655	Savannah.....	January 15, 16.....	500	33 33	.....
		Geneva.....	December 14, 15.....	250	45 00	125 00
		Jefferson.....	January 27, 28.....	150	25 53	.....
Athens	35,194	Andover.....	February 19, 20.....	270	27 25	.....
		Coolville.....	December 4, 5.....	250	20 52	105 58
		Athens.....	December 30, 31.....	300	34 80	.....
Auglaize	28,100	Amesville.....	January 13, 14.....	200	20 20	84 30
		Kossuth.....	December 21, 22.....	200	34 90	.....
Belmont	57,413	Unionopolis.....	February 8, 9.....	400	42 15	125 00
		Barnesville.....	December 14, 15.....	500	68 15	.....
Brown	29,899	Colerain.....	December 28, 29.....	500	63 75	86 69
		Hamersville.....	January 4, 5.....	300	30 75	.....
Butler	48,597	Russellville.....	January 10, 11.....	300	33 00	125 00
		Collinsville.....	February 27, 28.....	1,000	40 75	.....
		Shandon.....	February 8, 9.....	350	41 35	.....
Carroll	17,566	Monroe.....	February 15, 16.....	287	22 65	.....
Champaign.....	26,980	Carrollton.....	January 13, 14.....	750	52 69	52 69
		Gable.....	December 2, 3.....	400	17 90	80 94
		Westville.....	January 27, 28.....	250	26 00	.....
Clark	52,277	Mechanicsburg.....	February 3, 4.....	625	40 75	.....
		Enon.....	January 30, December 1.....	50	9 95	125 00
		Pitchin.....	February 17, 18.....	275	33 78	.....
Clermont.....	33,553	Vienna Cross Roads.....	February 24, 25.....	300	21 55	.....
		Batavia.....	January 6, 7.....	195	19 98	100 65
		Mt. Carmel.....	February 12, 13.....	100	19 10	.....
		Williamsburg.....	February 24, 25.....	500	22 85	.....

Clinton.....	24,240	Wilmington.....	December 11, 12	225	29 25	72 72
Columbiana.....	59,029	Blanchester.....	January 8, 9	335	22 84	
		Gretna.....	January 4, 5	279	50 50	125 00
		New Lisbon.....	February 10, 11	700	40 00	
Coshocton.....	26,763	New Waterford.....	February 22, 23	150	13 75	
		Keene.....	December 21, 22	225	30 38	80 10
		Warsaw.....	January 22, 23	350	20 30	
		Plainfield.....	February 10, 11	340	26 70	
Crawford.....	31,927	Bucyrus.....	December 9, 10	300	31 92	95 78
		New Washington.....	January 18, 19	650	31 92	
Cuyahoga.....	309,970	Sulphur Springs.....	February 22, 23	400	30 00	
		Euclid.....	December 21, 22	225	44 60	125 00
		Dover.....	December 11, 12	550	51 60	
Darke.....	42,961	Chagrin Falls.....	February 3, 4	275	20 50	125 00
		Arcanum.....	January 15, 16	600	26 82	
		Versailles.....	February 1, 2	275	36 92	
Defiance.....	25,769	Greenville.....	December 9, 10	250	29 00	77 30
		Hicksville.....	January 4, 5	500	33 05	
Delaware.....	27,189	Sunbury.....	December 14, 15	400	40 78	81 56
		Berlin Heights.....	January 8, 9	300	10 25	
Erie.....	35,462	Sandusky.....	December 14, 15	350	31 65	106 38
		Milan.....	January 11, 12	250	35 42	
		Amanda.....	February 24, 25	400	35 46	
Fairfield.....	33,939	Pleasantville.....	January 6, 7	500	26 00	101 81
		Greencastle.....	January 18, 19	600	33 96	
Fayette.....	22,309	Bloomington.....	February 22, 23	250	23 78	
		New Martinsburg.....	December 9, 10	250	23 40	66 92
Franklin.....	124,087	Grove City.....	February 26, 27	300	17 40	
		Canal Winchester.....	December 7, 8	200	23 85	125 00
		Westerville.....	January 6, 7	400	41 61	
Fulton.....	22,023	Watson.....	February 19, 20	280	32 00	
		Delta.....	December 2, 3	400	29 00	\$66 06
Gallia.....	27,005	Clay Chapel.....	January 8, 9	680	29 40	
Geauga.....	13,489	Chardon.....	November 30, December 1	380	15 50	81 01
Greene.....	29,820	Xenia.....	February 1, 2	400	29 15	40 46
		Cedarville.....	January 15, 16	700	87 80	89 46
		Camestown.....	February 1, 2	700	32 00	
Guernsey.....	28,645	Cambridge.....	February 15, 16	400	29 82	85 92
		Quaker City.....	December 16, 17	400	42 96	
Hamilton.....	374,573	Newtown.....	January 29, 30	300	22 05	
		Mt. Healthy.....	December 28, 29	380	32 99	125 00
		Blueash.....	January 25, 26	300	41 06	
Hancock.....	42,563	Arcadia.....	February 26, 27	325	39 65	
		Benton Ridge.....	December 21, 22	240	38 30	125 00
		Mt. Blanchard.....	January 29, 30	600	37 00	
		Forest.....	February 3, 4	475	41 06	
		Ada.....	February 17, 18	250	42 20	86 81
Hardin.....	28,939	Cadiz.....	February 24, 25	400	43 40	
		Freeport.....	December 16, 17	400	126 00	162 49
Harrison.....	20,830	Liberty Center.....	December 30, 31	475	65 00	
		Grelton.....	December 7, 8	262	23 11	75 24
Henry.....	25,080	Volgate.....	December 30, 31	216	29 45	
			January 27, 28	142	18 07	

FARMERS' INSTITUTES, ETC.—Continued.

Counties.	Population.	Institutes held.		Attendance reported.	Local expense reported by society.	Per capita allowance to institute societies under the institute law.
		Where.	When.			
Highland.....	29,048	Hillsboro.....	February 8, 9.....	700	\$30 70	\$87 14
Hocking.....	22,658	Rainsboro.....	February 22, 23.....	375	43 50	67 97
Holmes.....	21,139	Logan.....	January 4, 5.....	250	20 35	63 41
Huron.....	31,949	Killbuck.....	December 23, 24.....	250	17 65	.....
		Millersburg.....	February 12, 13.....	200	22 00	.....
		Monroeville.....	January 13, 14.....	350	23 50	95 84
		Wakenan.....	January 15, 16.....	475	28 19	.....
Jackson Jefferson.....	28 408 39,415	Greenwich.....	January 22, 23.....	450	30 48	.....
		Camba.....	March 17, 18.....	175	10 50	85 22
		Mt. Pleasant.....	December 14, 15.....	500	39 90	118 24
		Smithfield.....	January 11, 12.....	175	38 40	.....
Knox.....	27,600	Richmond.....	February 8, 9.....	800	78 60	.....
		Mt. Vernon.....	January 20, 21.....	250	19 50	82 80
		Fredericktown.....	February 10, 11.....	500	27 60	.....
		Danville.....	February 26, 27.....	350	11 31	.....
Lake.....	18,235	Painesville.....	December 16, 17.....	600	65 63	54 70
		Madison.....	January 29, 30.....	450	29 50	.....
		Labelle.....	December 2, 3.....	150	13 45	118 66
		Granville.....	December 23, 24.....	300	41 06	125 00
Lawrence Licking.....	39,556 43,279	Jersey.....	February 8, 9.....	233	35 00	.....
		Utica.....	January 25, 26.....	232	39 67	.....
		West Mansfield.....	December 16, 17.....	200	18 20	82 15
		Bellevue.....	January 25, 26.....	275	27 38	.....
Logan.....	27,386	De Graff.....	February 12, 13.....	300	25 72	.....
		Bellevue.....	December 23, 24.....	344	39 10	120 88
		Kipton.....	January 18, 19.....	400	40 25	.....
		Copola.....	February 22, 23.....	150	11 00	125 00
Lorain.....	102,296	Sylvania.....	December 4, 5.....	200	9 05	.....
		Waterville.....	January 11, 12.....	400	64 20	.....
		Maumee.....	December 28, 29.....	500	30 10	60 17
		Plain City.....	January 4, 5.....	400	30 08	.....

Mahoning	55,979	Canfield	January 6, 7	500	815 47	\$125 00
Marion	24,727	North Lima	February 12, 13	350	33 09	
Medina	21,742	North Jackson	February 24, 25	600	35 75	
Meigs	29,813	Caledonia	December 7, 8	200	25 00	74 18
Mercer	27,290	Marion	January 22, 23	250	30 00	
Miami	39,754	Poe	January 13, 14	250	23 00	65 22
Monroe	25,175	Brunswick	January 20, 21	400	8 68	
Montgomery	100,852	Chatham	February 19, 20	250	7 30	
Morgan	19,143	Chester	February 19, 20	350	23 00	89 43
Morrow	18,120	Dyersville	December 2, 3	400	24 19	
Muskingum	51,210	Fort Recovery	December 28, 29	400	21 25	81 65
Noble	20,753	Rockford	January 18, 19	190	31 70	
Ottawa	21,974	Neptune	February 5, 6	300	22 00	
Pauiding	25,932	Troy	February 13, 14	300	27 70	119 25
Perry	31,151	West Charleston	January 29, 30	450	43 63	
Pickaway	26,959	Bealsville	February 15, 16	350	32 19	
Pike	17,482	Bealsville	December 11, 12	295	35 00	7 52
Portage	27,868	Wadala	February 1, 2	300	26 58	
Preble	23,421	Mamaburg	January 29, 30	500	41 65	125 00
Putnam	30,188	Centerville	February 17, 18	300	40 00	
Richland	38,072	Chester Hill	February 19, 20	300	42 30	
Ross	39,454	Cardington	January 25, 26	600	25 55	57 42
		Marengo	February 5, 6	400	27 18	54 35
		White Cottage	February 19, 20	200	10 00	
		Chandlersville	December 18, 19	400	43 35	125 00
		Adamsville	January 27, 28	500	55 11	
		Sarahsville	February 5, 6	450	41 65	
		Summerfield	December 9, 10	100	30 70	62 25
		Port Clinton	February 3, 4	350	32 76	
		Ankwerp	December 16, 17	500	40 95	65 92
		Oakwood	December 11, 12	150	25 00	77 19
		Payne	January 1, 2	250	34 30	
		Thornville	February 1, 2	200	17 40	
		Rehoboth	December 21, 22	600	46 25	93 45
		New Holland	January 8, 9	600	30 70	
		Tarlton	January 15, 16	450	29 85	80 87
		Ashville	January 20, 21	225	28 55	
		Pikeeton	February 17, 18	500	26 95	
		Idaho	December 9, 10	100	10 00	52 44
		Windham	December 28, 29	150	11 32	
		Martins Station	January 23, 23	300	23 15	83 60
		Edinburg	February 5, 6	300	30 15	
		Lewisburg	February 26, 27	300	15 00	
		Camden	February 3, 4	400	29 00	70 25
		Leipsic	February 10, 11	600	32 75	
		Continental	December 23, 24	135	32 00	90 56
		Columbus Grove	January 29, 30	500	33 05	
		Lucas	February 26, 27	180	30 15	
		Belville	December 4, 5	180	26 72	114 21
		Kardio	January 18, 19	400	27 25	
		Kingston	February 12, 13	500	37 58	
		Frankfort	December 11, 12	630	41 30	118 36
			January 22, 23	400	42 30	

FARMERS' INSTITUTES, ETC.—Continued.

Counties.	Population.	Institutes held.		Attendance reported.	Local expense reported by society.	Per capita allowance to institute societies under the institute law.
		Where.	When.			
Sandusky.....	30,617	Fremont ..	December 18, 19.....	500	\$31 00	\$91 85
Scioto.....	35,377	Clyde.....	February 26, 27.....	600	45 00	45 00
		Haverhill.....	December 4, 5.....	350	19 15	106 13
		Scioto	December 7, 8.....	75	22 40	22 40
		Mt. Joy	December 30, 31.....	200	43 10	43 10
Seneca.....	40,869	Atlica.....	December 11, 12.....	400	40 85	122 60
		Tiffin.....	January 15, 16.....	500	62 00	62 00
		Greenspring.....	January 25, 26.....	350	40 20	40 20
Shelby	24,707	Sidney.....	December 18, 19.....	100	22 00	74 12
		Jackson Center.....	January 1, 2.....	300	29 45	29 45
Stark.....	84,170	Beach City.....	January 10, 11.....	250	14 00	135 00
		New Berlin.....	January 18, 19.....	500	23 50	23 50
		Marboro.....	February 15, 16.....	500	32 00	32 00
Summit.....	54,089	Osborn Corners.....	January 11, 12.....	350	55 97	125 00
		North Springfield.....	January 20, 21.....	250	32 90	32 90
Trumbull.....	42,373	Burg Hill	January 8, 9.....	365	34 33	135 00
		Quincy.....	January 25, 26.....	300	29 20	29 20
		Grand.....	February 17, 18.....	325	39 39	39 39
Tuscarawas	46,618	Unionville.....	December 18, 19.....	68	36 30	125 00
		New Philadelphia.....	January 15, 16.....	300	30 00	30 00
Union	22,860	Gnadenhutten.....	February 8, 9.....	320	26 20	26 20
		Marysville.....	February 5, 6.....	500	35 00	68 58
Van Wert	29,671	Richwood	February 19, 20.....	600	34 00	34 00
		Ohio City.....	December 23, 24.....	250	20 49	89 01
Vinton	16,045	Van Wert.....	January 22, 23.....	325	28 38	28 38
		Wilkesville.....	November 30, December 1.....	300	14 54	48 13
		New Plymouth.....	January 1, 2.....	210	12 75	12 75
Warren.....	25,468	Lebanon	December 30, 31.....	300	24 95	76 40
		Franklin	February 5, 6.....	400	30 90	30 90
		*Waynesville.....				

Washington	42,380	Lower Salem	December 7, 8	800	51 00	125 00
Wayne	38,005	Watertown	January 11, 12	500	38 00	.....
Williams	24,897	Wooster	November 30, December 1	600	41 00	117 01
Wood	44,392	Shreve	February 15, 16	950	39 00	.....
Wyandot	21,722	Creston	February 17, 18	400	25 73	.....
		Montpelier	November 30, December 1	300	17 13	74 63
		Bryan	January 6, 7	200	22 00	.....
		Bowling Green	January 13, 14	400	15 65	25 00
		Grand Rapids	January 25, 26	252	42 00	.....
		Bloomdale	January 27, 28	100	31 95	.....
		Nevada	January 20, 21	500	32 92	65 16
		Upper Sandusky	February 22, 23	200	23 40	.....
				76,815	\$8,718 40	\$8,173 35

*The institute appointed for Waynesville was not held, but one was held in its place at Centerburg, Knox county.

AGRICULTURAL REPORT.
INDEPENDENT INSTITUTES.

Counties.	'Institutes held.		Attendance reported.	Local expenses reported by society.
	Where.	When.		
Allen	Bluffton	January 15, 16.....	400	\$21 00
Ashland	Polk	February 5, 6.....	400	29 75
Brown	Decatur	January 19, 20.....	250	25 00
Champaign	North Lewisburg	February 10, 11.....	500	11 00
Clark	South Charleston	December 18, 19.....	200	19 65
Clermont	Mulberry	January 29, 30.....	260	26 35
Columbiana	Columbiana	January 29, 30.....	425	35 60
Cuyahoga	Strongsville	February 26, 27.....	450	40 74
Henry	Deshler	February 26, 27.....	95	13 05
Hocking	Laurelville	March 12, 13.....	310	34 80
Huron	Townsend Center	February 3, 4.....	500	17 25
	New London	February 26, 27.....	400	14 00
Knox	Centerburg	February 12, 13.....	300	30 55
Lake	Willoughby	December 4, 5.....	500	23 00
Licking	Brownsville	February 11, 12.....	200	13 00
Marion	Waldo	February 23.....	400	21 78
Mercer	Mendon	February 12, 13.....	100	5 35
	Wabash	March 13.....	139	4 30
Miami	Covington	February 5, 6.....	500	37 00
Muskingum	Norwich	December 17, 18.....	400	38 00
	Frazzysburg	February 11, 12.....	275	66 60
Preble	New Paris	January 29, 30.....	500	52 10
Stark	Alliance	January 27, 28.....	250	35 25
Summit	Cuyahoga Falls	January 15, 16.....	400	135 00
Trumbull	Newton Falls	February 4.....	500	16 55
Totals			8,654	\$766 67

RECAPITULATION.

1.	Amount collected by the State Board of Agriculture from the three mills per capita tax, from the eighty-eight (88) counties of the state, in all of which institutes were held.....	\$8,252 54
2.	Amount allowable to two hundred and twelve (212) institute societies from the three mills per capita tax, from the eighty-eight (88) counties of the state, in all of which institutes were held	8,173 35
3.	Amount expended by the State Board of Agriculture in aid of two hundred and twelve (212) county institutes for lecturers..	6,206 81
4.	Amount expended by county societies for expenses of two hundred and twelve (212) institutes.....	6,718 40
5.	Total expenses for two hundred and twelve (212) institutes	12,925 21
6.	Average expenditure, per institute, by the State Board of Agriculture for lecturers.....	29 28
7.	Average expenditure, per institute, by societies.....	31 68
8.	Total average expense per institute....	60 96
9.	Total average number of persons in attendance at two hundred and twelve (212) institutes	76,815
10.	Average number of persons in attendance at each	362.4
11.	Number of independent institutes reported.....	25
12.	Expense of twenty-five (25) independent institutes	766 67
13.	Average expense of independent institutes.....	30 67
14.	Total average number of persons attending the twenty-five (25) independent institutes reported.....	8,654
15.	Average attendance at each of the twenty-five (25) independent institutes reported	346.2

Names of Lecturers

AND THEIR

Topics for the Institute Season of 1896-97.

Lecturers From Agricultural Department of the Ohio State University,
Columbus, Ohio.

Prof. William R. Lazenby.

HORTICULTURE AND FORESTRY.

1. Profitable Garden Crops. Twenty-five minutes.
2. Weeds and Insect Enemies. Twenty-five minutes.
3. Science and Farming. Thirty minutes.
4. Winter Gardening for Profit. Twenty-five minutes.
5. How to Make and Manage an Apple Orchard. Thirty minutes.
6. Talks about Plants and Flowers. Twenty-five minutes.
7. Horticulture and Health. Thirty minutes.
8. How to Beautify the Home. Thirty minutes.

Prof. W. A. Kellerman.

BOTANY.

1. Recent Methods in Prevention of Smut of Wheat and Oats. Forty minutes.
2. A Chapter in Vegetable Physiology. Forty minutes.
3. Bacteria—What they Are and What they Do. Fifty minutes.
4. An Education that is Practical. Fifty minutes.
5. Vegetable Parasites of the Orchard. Thirty to forty minutes.
6. The Air we Breathe. Forty minutes.
7. Science on the Farm. Forty minutes.

Prof. Thomas F. Hunt.

AGRICULTURE.

1. The Farmers' Need of Education. Forty minutes. (N.)
2. Ohio Agriculture. Forty minutes. (N.)
3. Corn Culture. Forty minutes.
4. The Feeding Value of Stock Foods. Fifty minutes.
5. The Economy of Ensilage. Twenty minutes.
6. The Importance of Water to Plants. Thirty minutes.
7. Tillage, How Best Performed. Thirty minutes.

8. Wool, Its Structure and Uses. Twenty minutes.
9. The Manufacture and Sale of Butter. Thirty minutes.
10. A Good Dairy Cow, Twenty minutes.
11. What Kind of Horses Shall we Breed? Thirty minutes.
12. The College of Agriculture of the Ohio State University. Fifteen minutes.

Prof. W. David Gibbs.

AGRICULTURE.

1. Origin and Nature of Soils. Twenty minutes.
2. Effect of the Physical Properties of Soils on Fertility. Twenty minutes.
3. The Importance of Water in Crop Growth. Twenty minutes.
4. Modern Methods of Cultivation. Twenty minutes.
5. Some Reasons for Crop Rotation. Twenty minutes.
6. The Objects of an Agricultural Education. Twenty minutes.
7. The Farmer's Opportunities. Thirty minutes. (N.)
8. Principles of Stock Feeding. Twenty minutes.
9. Principles of Stock Breeding. Twenty minutes.

Chas. W. Burkett.

AGRICULTURE.

1. Principles of Feeding. Twenty-five minutes.
2. Corn Culture. Twenty minutes.
3. How to Treat Worn out Lands. Twenty minutes.
4. Equipment and Management of the Dairy. Fifteen minutes.
5. Ensilage. Fifteen minutes.
6. Plant Food. Fifteen minutes.
7. Practical Side of Soils. Twenty minutes.
8. Agricultural Education. Fifteen minutes.
9. Country Life the Ideal Life. Twenty-five minutes. (N.)
10. The Farmer's Mission. Twenty-five minutes. (N.)

**Lecturers From The Ohio Agricultural Experiment Station,
Wooster, Ohio.**

C. E. Thorne.

DIRECTOR.

1. Hints to Purchasers of Commercial Fertilizers. Thirty minutes.
2. How to Obtain "Ammonia" without Cost. Thirty minutes.
3. Can we Afford to Make Barnyard Manure? Thirty minutes.
4. Some Points in Cattle Feeding. Thirty minutes.
5. Some Wastes on the Farm. Thirty minutes.
6. Grain Smuts, Their Cost and Prevention. Thirty minutes.
7. The Spraying of Orchards. Thirty minutes.
8. What Shall we Eat? Forty-five minutes. (N.)
9. The Farm and the School. Forty-five minutes. (N.)

W. J. Green.

HORTICULTURIST.

1. Irrigation for the Garden. Twenty minutes.
2. Are Northern Grown Seeds Superior to Others? Twenty minutes.
3. Pedigree in Plants. Twenty to thirty minutes.
4. Fertilizers for Potatoes. Twenty minutes.
5. Essentials in Orchard Management:
 - a. Cultivation. Twenty minutes.
 - b. Spraying. Twenty minutes.
 - c. Pruning and Thinning. Twenty minutes.
 - d. Maintaining Fertility in Orchards. Twenty minutes.
6. Gardening Under Glass. Twenty minutes.
7. Horticulture as a Means of Recreation. Thirty minutes
8. The Culture of Small Fruits for Home Use. Thirty minutes.

J. Fremont Hickman.

AGRICULTURIST.

1. A Few Hints in Growing a Crop of Oats. Twenty minutes.
2. Stabling and Management of Dairy Cows. Thirty minutes.
3. Commercial Fertilizers. Twenty-five minutes.
4. A Few Mistakes we Farmers make. Forty minutes. (N.)
5. Preserving and Applying Liquid Manures. Thirty minutes.
6. Alfalfa, Crimson Clover, Rape and other Forage Plants. Twenty minutes
7. Modern Methods in Corn Culture. Twenty-five minutes.
8. Some Facts in Feeding for Beef. Twenty minutes.
9. Timely Thoughts for Girls and Boys of the Farm. Twenty minutes.
10. The Relative Values of Food for Stock. Twenty minutes.
11. Shrinkage in Grain, Straw and Hay. Fifteen minutes.
12. Dehorning, Feeding and Rearing Calves. Twenty minutes.
13. Does the Farmer Need an Education? Twenty-five minutes.
14. The Tenant Farmer. Twenty minutes.

Augustine D. Selby.

BOTANIST AND CHEMIST.

1. Weeds: What are our Worst Weeds? Twenty minutes.
2. Plant Diseases: How Caused and How Prevented. Twenty-five minutes.
3. Diseases of the Plum and Cherry. Twenty minutes.
4. Diseases of the Peach and Spraying Peach Trees. Forty minutes.
Specifically:—
 - a. Peach Yellows and Crown Gall. Twenty minutes.
 - b. Peach Curl, Mildew, Fruit Spots, Rot and Prevention. Twenty-five minutes.
5. The Smuts of Grain and their Prevention. Twenty-five minutes.
6. Methods of Fruit Canning and Fruit Preservation. Thirty to forty minutes.
7. The Fecundation of Flowers as a Problem for Farmers and Fruit Growers
Twenty five to forty minutes.

8. Science Training in Farm Life. Thirty minutes.
9. Hints to Purchasers of Commercial Fertilizers. Thirty minutes.
10. Chemistry Applied to Cookery and Diet. Twenty minutes.

F. M. Webster.

ENTOMOLOGIST.

1. The Hessian Fly and Methods of Prevention. Twenty minutes.
2. The Western Corn-Root Worm in Ohio. Twenty-five minutes.
3. Some of the Older Pests of the Corn Field. Twenty minutes.
4. Some Insect Enemies of Clover. Twenty minutes.
5. How to Deal with Insect Pests of the Orchard. Twenty minutes.
6. Some Little Known Wheat Insects. Twenty minutes.
7. The Farmer Boy: What Shall His Future be? Fifty minutes.
8. The Chinch Bug. Twenty minutes.

**Lecturers Employed by the Ohio State Board of Agriculture, with
Postoffice Addresses and Topics.**

John Begg, Columbus Grove, O.

1. Thirty Years' Experience in Corn Culture. Twenty minutes.
2. Raising Hogs for Market—How Best Accomplished. Twenty minutes.
3. Farm Literature—What it should be. Thirty minutes. (N.)
4. Practical Economy in Farm Management. Twenty minutes.
5. The Farmer and the Public Schools. Thirty-five minutes. (N.)
6. What of the Cattle Business? Twenty minutes.
7. How Shall We Keep Up the Fertility of Our Farms? Fifteen minutes.
8. The Bright Side of Farm Life. Forty-five minutes. (N.)
9. Shall We Keep on Tiling? Twenty minutes.
10. Value of Incidental Profits in Farming. Twenty-five minutes.
11. The New Farmer. Forty minutes.

J. H. Brigham, Delta, O.

1. The Farmer's Share. Thirty to forty-five minutes.
2. How I Restore and Maintain the Fertility of My Land. Twenty to Twenty-five minutes.
3. Why Prices of Farm Products are High or Low. Twenty minutes.
4. Suggestions to Boys Who are Ambitious. Thirty to forty minutes. (N.)
5. Give the Boys and Girls a Chance. Twenty minutes.
6. Why Farmers Should Organize. Forty minutes. (N.)
7. What the Agricultural and Mechanical Colleges and Experiment Stations Should do for Farmers. Thirty to forty minutes. (N.)
8. Taxation. Twenty-five minutes.

9. How I Raised a Good Crop of Corn in a Very Wet Season and Another in a Very Dry Season, When Some of My Neighbors Failed to do so. Twenty minutes.
10. How the Secretary of Agriculture Can Help the Farmers. Thirty minutes.
11. The "New Farmer." Forty minutes. (N.)
12. The "New Farmer's" Wife. Twenty minutes.
13. Hard-Times Lessons. Twenty minutes.
14. Farming East and West, North and South. Twenty minutes.
15. A Farmer's Paradise. Twenty minutes.
16. Drought or flood. Twenty minutes.
17. The Work of the State Board of Agriculture, and Its Relation to the Farmers of Ohio. Thirty minutes.

Waldo F. Brown, Oxford, O.

1. A Talk on Weeds. Twenty minutes.
2. Incidental Profits of the Farm. Twenty-five minutes.
3. Farm Buildings and Cement Floors. Twenty-five minutes.
4. A Poultry Talk. Twenty-five minutes.
5. Stock Foods and Feeding. Twenty minutes.
6. Good Roads. Fifteen minutes.
7. The Essentials of a Good Home. Twenty-five minutes.
8. Wanted, A Man. Fifty minutes. (N.)

W. N. Cowden, Quaker City, O.

1. Should the Farmer with Present Conditions and Prospects Keep Sheep? Twenty minutes.
2. How to Make Sheep Husbandry Profitable. Twenty minutes.
3. Peach Culture. Twenty minutes.
4. Profitable Fruit Growing. Thirty minutes.
5. Education Needed by the Farmer. Thirty minutes. (N.)
6. Farming on or off the Farm—Which? Twenty-five minutes. (N.)
7. Taxation. Forty minutes.

F. A. Derthick, Mantua, O.

1. How to Make the Most from the Dairy. Thirty minutes.
2. A Talk About the Horse. Twenty-five minutes.
3. Experiences in Spraying Apples in 1896. Twenty minutes.
4. Corn Culture. Twenty minutes.
5. What to Read and How to Read. Twenty minutes.
6. The Mission of Farmers' Organizations. Twenty-five minutes.
7. Culture of the King and His Wife. Forty minutes. (N.)
8. Why I am a Farmer. Twenty-five minutes. (N.)
9. Government Bounty on Exported Staple Products. Thirty minutes. (N.)
10. The State Board of Agriculture, Its Work and Its Relation to the Farmers of Ohio. Thirty minutes.
11. Four Years with Potatoes. Twenty minutes.
12. Mixed or Special Farming, Which? Thirty minutes.

S. H. Ellis, Springboro, O.

1. The Outlook for the Farmer Boy. Twenty minutes.
2. The Bond of Union Among Farmers. Twenty-five minutes.

3. Some of the Advantages Derived from Farmers' Institutes. ~~Thirty minutes.~~
4. Small Fruits on the Farm. Twenty minutes.
5. The Agricultural Experiment Station. Twenty-minutes.
6. The Corn Crop. Twenty-five minutes.
7. How to Grow and Market Hogs. Twenty-five minutes
8. The Outlook for the Hog Industry. Twenty minutes.
9. Wash Day in the Farm Home. Twenty-five minutes

E. E. Elliott, Morning Sun, O.

1. The Output of Agricultural Information and Its Practical Application. Twenty minutes.
2. Grasses and Their Adaptation. Twenty-five minutes.
3. Farming in a Wet Season. Fifteen to twenty-minutes.
4. Weeds and Their Uses. Fifteen to twenty minutes.
5. Forage and Fodder Plants. Twenty minutes.
6. The Abuses of Agricultural Fairs. Twenty minutes.
7. The Right and Wrong Theory of Cross-breeding. ~~Twenty minutes.~~
8. Books from a Farmer's Point of View. Twenty minutes.
9. My Mistakes in Hog Raising. Fifteen to twenty minutes.
10. Master or Slave. Thirty minutes. (N.)
11. My Neighbor and I. Thirty-five minutes. (N.)

W. W. Farnsworth, Waterville, O.

1. The How, Why and When of Spraying. Twenty minutes.
2. Pleasure, Profit and Health from the Strawberry. ~~Twenty minutes.~~
3. Shall the Farmer Grow Fruit? Twenty minutes.
4. Profitable Raspberry Culture. Twenty minutes.
5. The Pear and Plum as Moneymakers. Twenty minutes.
6. Currants and Gooseberries Commercially Considered. ~~Twenty minutes.~~
7. Ornamental Planting for the Farmer. Twenty minutes.
8. The Farmer's Boy—Is he Receiving too Many Advantages? ~~Twenty minutes.~~
9. How may we Render Available and Preserve and Increase the Fertility of our Fruit Farms? Thirty minutes.

H. M. Foreman, Waterford, O.

1. Organic Elements of the Soil. Twenty minutes.
2. Inorganic Elements of the Soil. Twenty minutes.
3. Lime as a Fertilizer. Fifteen minutes.
4. Making and Saving Manures. Twenty minutes.
5. Moral Lessons From the Farm. Twenty-five minutes. (N.)
6. Our School System and the Farm. Twenty minutes. (N.)
7. A Successful Farmer. Twenty-five minutes. (N.)
8. Behind Time. Fifteen minutes.
9. A Farmer's Education. Fifteen to twenty-five minutes. (N.)
10. A Farmer's Wife. Fifteen to twenty-five minutes.

C. M. Freeman, Rex, O.

1. Special versus General Farming. Twenty-five minutes.
2. Caring for Cornfodder. Fifteen minutes.
3. The Preservation of our Forests. Twenty-five minutes.

4. Why Farmers are Humbugged in Buying Fruit Trees. Twenty minutes.
5. Why Young Trees Die for Farmers. Twenty minutes.
6. Some Business Requirements of the Farmer. Twenty minutes.
7. Do Farmers Need to Organize? Twenty minutes.
8. Can We Afford Township High Schools? Forty minutes. (N.)
9. What Shall We do with our Boys and Girls? Forty minutes. (N.)

J. F. Greene, Sandusky, O.

1. Recent School Legislation—What More is Needed? Twenty to forty minutes.
2. Education of Farmers' Girls and Boys. Twenty to thirty minutes.
3. The Citizen Farmer. Thirty minutes. (N.)
4. A Farmer's Library: Of What it Should Consist and How Obtained. Thirty minutes.
5. Small Fruit for the Home. Fifteen to thirty minutes.
6. Small Fruit for Market. Fifteen to thirty minutes.
7. Preparation of Soil for a Crop. Twenty minutes.
8. Value of Organization to the Farmer. Thirty minutes.
9. Noxious Weeds in Fields and Other Places. Twenty minutes.
10. Spraying: How Done—Does it Pay? Fifteen minutes.
11. Shall Farmers Insure their Property In their Own Companies? Fifteen to twenty minutes.
12. How to Organize and Manage Farmers' Mutual Insurance Companies. Fifteen to twenty minutes.

S. H. Hurst, Chillicothe, O.

1. Growing an Apple Orchard. Thirty minutes.
2. The Conditions of Plant Growth. Thirty minutes.
3. The Garden and Truck Patch. Thirty minutes.
4. Handling and Keeping Fruits. Thirty-five minutes.
5. Fruits in Variety for the Family. Thirty-five minutes.
6. Pantry, Kitchen and Dining Room. Thirty minutes.
7. Nobility of Character. Forty minutes. (N.)
8. The Mission of the Great Republic. Forty minutes. (N.)
9. Liberty Regulated by Law. Forty minutes.

George E. Lawrence, Marion, O.

1. Clover. Fifteen to twenty minutes.
2. King Corn. Twenty minutes.
3. The Strawberry. Fifteen to twenty minutes.
4. The Raspberry. Fifteen to twenty minutes.
5. Get out of the Ruts. Twenty minutes.
6. The Farmer as a Citizen. Forty to fifty minutes. (N.)

T. C. Laylin, Norwalk, O.

1. Fields and Fences. Twenty minutes.
2. Farmers' Problems. Twenty minutes.
3. Breeding and Management of Mutton Lambs. Twenty minutes.

4. The Origin and Preservation of Fertility. Twenty minutes.
5. Business Methods and Education. Twenty minutes. (N.)
6. Genius in Farming. Twenty minutes.

Theo. F. Longenecker, Dayton, O.

1. Farmers and Fairs. Twenty minutes.
2. Plant Food and Plant Growth. Twenty minutes.
3. The Strawberry. Fifteen minutes.
4. The Grape and How to Care for it. (Illustrated.) Fifteen minutes.
5. A Study in Tree Fruits. (Illustrated.) Twenty minutes.
6. The New and the Old in Grain, Fruits and Vegetables. Fifteen minutes.
7. Budding, Grafting—Reproduction from Buds and Cuttings. (Illustrated.) Fifteen minutes.
8. Insect Enemies of Orchard and Garden. Fifteen minutes.
9. Fungous Diseases and How to Prevent them. Fifteen minutes.
10. Economy in Beautifying Home Surroundings, or Landscape Gardening. (Illustrated.) Twenty minutes.
11. The Golden Rule Applied to the Social Problem. Forty minutes. (N.)
12. Education Versus Learning. Forty minutes. (N.)

C. D. Lyon, Higginsport, O.

1. Home-Made Farm Conveniences. (Illustrated.) Twenty-five to thirty minutes.
2. The Farm Workshop and its Tools. Twenty to twenty-five minutes.
3. A Half Hour in the Corn Field. Fifteen to twenty-five minutes.
4. To Plow or not to Plow—The Merits of Deep and Shallow Plowing. Twenty to twenty-five minutes.
5. The Farm Team, How to Feed and Care for it. Twenty to twenty-five minutes.
6. The Permanent Pasture, Methods of Seeding and Caring for it. Twenty to twenty-five minutes.
7. The Farmer's Garden. Fifteen to twenty minutes.
8. The Farm Poultry Yard. Fifteen minutes.
9. The Care of Farm Implements. Fifteen to twenty-five minutes.
10. How to Farm Hillside. Twenty minutes.
11. A Talk upon Wheat Raising. Twenty to thirty minutes.
12. Fertilizers, their Use and Abuse. Twenty-five to thirty-five minutes.

S. K. McLaughlin, Hurford, O.

1. Coarse Lambs and Yearlings for Mutton. Twenty minutes.
2. How I raised a Good Crop of Wheat in 1896 when my Neighbors failed to do so. Twenty minutes.
3. The Farmer's Garden and Truck Patch. Twenty minutes.
4. Under Existing Conditions shall we Continue to raise Wool? Twenty to thirty minutes.
5. The Model Farmer's Home. Thirty minutes. (N.)
6. Then and Now. Thirty minutes. (N.)
7. The Farmer's Wife. Twenty minutes.
8. Good Roads, How to Secure and Maintain them. Fifteen to twenty minutes.

J. L. Roudsbush, Stone Lick, O.

1. What Weeds, Insect Pests and Fungi cost the Farmers of Ohio. Twenty minutes.
2. How to Destroy Weeds, Insect Pests and Fungi. Twenty minutes.
3. Value of Little Things in Profit and Loss in Farming. Fifteen minutes.
4. The Farmer's Garden. (Illustrated.) Fifteen minutes.
5. Corn. Fifteen minutes.
6. Some Mistakes in Feeding Breeding Animals. Fifteen minutes.
7. Small Fruits. Fifteen minutes.
8. Potatoes. Fifteen minutes.
9. The Farmer's Daughter. Thirty minutes. (N.)
10. How I Maintain Fertility. Fifteen minutes.

George E. Scott, Mount Pleasant, O.

1. What we Owe to Clover. Twenty minutes.
2. The Science of Practical Potato Culture. (Illustrated.) Twenty minutes.
3. Does Fifty Cent Wheat Pay? Twenty minutes.
4. Feed and Care of the Dairy Calf and Cow. Twenty minutes.
5. The Hen, Egg and Chick. Fifteen minutes.
6. Equipment for Home Dairying. Twenty minutes.
7. Pig, Hog and Ham. Fifteen minutes.
8. The Babcock Test, What it Reveals. Eighteen minutes.
9. Creameries—Private, Co-operative and Joint Stock. Fifteen minutes.
10. Attractions for Farm and Home. (Illustrated.) Twenty-five minutes. (N.)
11. "Fool Things." Thirty minutes. (N.)

John L. Shawver, Bellefontaine, O.

1. The Farm Dairy. Thirty minutes.
2. Points in Butter Making. Thirty minutes.
3. Small Fruits. Twenty-five minutes.
4. Farm Buildings. Thirty minutes.
5. What Shall the Sheep Men do? Twenty minutes.
6. Household Helps. Twenty minutes.
7. The Business Side of Farm Life. Twenty minutes.
8. Clovers, Manures and Fertilizers. Thirty minutes.
9. Safeguards of Liberty. Twenty-five minutes.
10. Seed Time and Harvest. Forty minutes. (N.)

S. H. Todd, Wakeman, O.

1. How Deep Shall We Plow? Fifteen minutes.
2. How Can We Best Restore Our Worn Out Lands? Twenty minutes.
3. Winter Lambs, Care and Management. Twenty minutes.
4. How Can We Best Prevent Many of the Diseases that Prey Upon Our Hogs and Sheep? Twenty-five minutes.
5. Haphazard Feeding Versus Scientific Feeding. Twenty-five minutes.
6. Early Maturity in Our Animals, Its Value and How Obtained. Twenty-five minutes.

7. Selecting Breeding Stock to Get the Best Results. Twenty minutes.
8. What Breed of Sheep Should the Farmer Raise? Twenty minutes.
9. Raising Poultry for Profit. Fifteen minutes.
10. Corn Culture. Fifteen minutes.
11. The Pig—Its Care and Management. Twenty minutes.
12. Put on the Brake. Fifty minutes. (N.)
13. Which of the Two is the More Important Farm Crop, The Boys and Girls or the Stock? Sixty minutes. (N.)

O. J. Vine, Canton, O.

1. Our Mistakes in Farming. Fifteen minutes.
2. Practical Tile Draining. Twenty-five minutes.
3. The Farm Horse—His Feed and Care. Twenty minutes.
4. Feed and Stable Management of Dairy Cows. Twenty minutes.
5. Hints on Selection of Dairy Cows. Fifteen minutes.
6. How to Construct and Fill a Silo. Thirty minutes.
7. How to Make and Market Good Butter. Thirty minutes.
8. Farm Buildings, Their Construction and Care. Thirty minutes.
9. Improved Farm Methods. Twenty minutes.
10. Making and Applying Manure. Fifteen minutes.
11. Business Facts for Farmers. Twenty minutes. (N.)
12. The Training and Education of Our Children. Thirty minutes. (N.)
13. Suggestions to Young Men. Twenty-five minutes. (N.)

C. G. Williams, Gustavus, O.

1. Recent Potato and Fertilizer Experiments. (Illustrated.) Twenty-five minutes.
2. Farming on Paper. Twenty minutes.
3. To and Fro in the Potato Field. Twenty minutes.
4. The Best Way to Buy Commercial Fertilizers. Thirty minutes.
5. Winter Evenings and Leisure Hours. Thirty minutes. (N.)
6. What Inducement Does the Farm Hold Out to Young Men? Thirty-five minutes. (N.)

PAPERS READ.

AT

FARMERS' INSTITUTES 1896-1897.

FORWARDED TO THE SECRETARY OF THE DEPARTMENT OF AGRICULTURE FOR PUBLICATION IN THE ANNUAL INSTITUTE REPORT.

WOOL: ITS STRUCTURE AND PROPERTIES.

By PROFESSOR THOMAS F. HUNT, Dean of the College of Agriculture and Domestic Science, Ohio State University, Columbus, Ohio.

The estimated wool clip of the United States for the year 1893 was, according to S. N. D. North, about three hundred million pounds, about one-fifteenth of which was produced in Ohio. The average shrinkage upon scouring was sixty per cent., while the shrinkage for Ohio wool was 52 per cent. Ohio produced upon a scouring basis, therefore, about one-twelfth of the wool clip of the United States. This does not include pulled wool, namely, that from slaughtered sheep, which amounts to about fifteen million pounds and is not classified according to states. During the past ten years, we have been consuming from one-third to one-half as much foreign wool as domestic wool. If we divide a pie into six pieces, one of these pieces will represent the proportion of wool raised in North America compared with the total amount raised in the world. The quantity raised in South America will be represented by similar piece. The amount raised in Europe will be represented by two pieces. That of Australasia, by a piece and one-half, leaving the remaining one-half of a piece of pie to be divided among the other countries. The pie illustration referring to the wool produced in the world may not be an appetizing one, but may serve to fix this subject in our memory.

According to the authority quoted above, the average weight of fleece was $6\frac{1}{2}$ lbs., having a shrinkage of sixty per cent., making about $2\frac{1}{2}$ lbs. of scoured wool per sheep. According to the estimates of the United States Department of Agriculture, the average weight of fleece has very rapidly increased in the United States. It is estimated as follows: 1840-1.9 lbs., 1850-2.4 lbs., 1860-2.7 lbs., 1870-3.5 lbs., 1880-4.8 lbs., 1890-5.5 lbs. It is thus seen that the weight of fleece is about three times as large as it was fifty years ago in this country. In 1893, the weight of the Ohio fleece was five pounds compared with the average of $6\frac{1}{2}$ pounds for the United States. The shrinkage of Ohio wool is estimated at 52 per cent., thus making the Ohio scoured product 2.4 lbs., compared with $2\frac{1}{2}$ pounds for the United States.

If we divide the United States into two parts by means of the Mississippi river, we will find that fully two-thirds of the wool is produced west of the river. While the quantity of wool produced has been more than doubled west of the Mississippi since 1880, the amount raised east of that river has decreased. This condition is

doubtless in accord with historical facts. Wool raising is adapted to pastoral conditions where land is comparatively cheap and population comparatively scattered. Sheep raising is said to be decreasing in Europe with the increase of population and, I take it, that we may expect sheep raising or more especially — the production of wool — to decrease relatively in this country with the increase of population, and especially in those portions of the United States where the population is the densest. This is due to the fact that an acre of land will support more people when devoted to some other form of husbandry. Generally speaking, tillage rather than pasturage will support the densest population. The average yield of wool per sheep west of the Mississippi is estimated at about 5 lbs. This does not indicate that larger fleeces of wool can be grown in the west, but that more fine wool sheep and less mutton sheep are grown there.

It is said that if one pulls a wool fibre between the thumb and finger from the base toward the tip, it will glide through smoothly, while if pulled in the opposite direction from the tip to the root, it will appear rough and will not glide through as easily. A fibre of hair, on the other hand, will glide through the fingers about equally well in either direction. I confess that my own sense of touch is not sufficiently acute to note these differences. If, however, we examine a wool fibre under the microscope, we will see the reason why such differences might exist. Under the microscope a wool fibre looks not unlike a large number of bushel baskets packed one within the other, the top of the basket being toward the tip end of the wool fibre. This appearance is due to the structure of the wool fibre which may be described briefly about as follows: Wool fibre may be divided into three parts—the shaft, (the main body of the fibre); the thin membrane covering the shaft, and the scales which are supported by the thin and membranous covering. These scales are laid on the membranous covering much like the shingles on a house, with the butt end of the shingle pointing upwards. The constant motion of the fibres when on the sheep's back tends to work the oil or yolk toward the tip of the fibre or to the outer surface of the fleece and in doing so, carries with it any dirt or other foreign substance that may fall upon the sheep. The oil and dirt together accumulating on the outer surface of the fleece tends to protect the sheep from the rains.

If we take a bunch of scoured wool and put it on a block and beat it with a stick, it will become compacted together or felted. This characteristic of wool is due to these scales which by this process become interlocked and hold the fibres firmly together. It is simply a modification of this process by which wool is made into cloth by the carding method.

One of the chief differences between wool and hair which are structurally similar, is that the scales in the hair are not so numerous nor the projections so pronounced, consequently the hair does not felt. The larger the number of scales, the greater the felting property. The number varies with the fineness of the wool, there being the greater number in the finer wool. It has been estimated that upon the whole surface of a fibre of merino wool one inch long and 1-750 of an inch in diameter, that there are 23,000 of these scales or projections. These scales, as heretofore stated, are supported by the thin membranous covering which surrounds the main body of the fibre. This shaft or main portion of the fibre is composed of innumerable small spindle-shaped cells not unlike that of the muscular tissue of the body, and as in the muscles, these spindle-shaped cells allow a certain amount of elasticity in the wool fibre. In addition to these spindle-shaped cells, there is in the central portion of the fibre of some of the long wool sheep, a column of granular matter which appears under the microscope as a darkened column within the wool fibre. This characteristic serves to distinguish the long wools from the finer wool sheep and is observed in the Oxfordshire sheep showing the influence of the Cotswold cross on these sheep.

Our characteristic wools are classified commercially in three ways: 1st, upon condition, by which is meant cleanliness. 2nd, upon quality, by which is meant fineness. 3rd, upon staple, by which is meant length. The exact classification under these three heads varies with the market. Somewhat different classifications being used in Chicago and Boston markets. The classification also varies somewhat with the region from which the wool comes. The following classification is for the Boston market and applies to Ohio wools. It is given by that excellent wool authority, Charles F. Avery, in wool book for 1892. (See p. 3.)

CONDITION.

Washing—Sheep are driven into watercourses and a portion of the yolk (natural secretion through the skin, held in suspension in the wool) and dirt washed out before shearing.

Unmerchantable wool—Wool poorly washed is known as unmerchantable.

Unwashed wool—Wool on which no attempt at washing has been made is called unwashed.

The condition of washed wools is growing poorer; fifteen years ago fine wools lost in scouring 48 per cent. and sometimes less; the average present loss in Ohio and Michigan wools is nearer 55 per cent.

Scouring—Wool washed perfectly clean by mechanical and chemical processes in machines prepared for that purpose is known as scoured wool.

QUALITY.

The qualities are Picklock, XXX, XX, X, No. 1 (or half-blood), No. 2 (or three-eighths), No. 3, or quarter-blood, and coarse or common. These qualities are liable to variation in many woolhouses, according to the varying demand.

Picklock (now very scarce) is the quality produced from a pure Saxony sheep.

XXX—The first cross of the merino with the Saxony.

XX—The true standard is the quality of a full-blood merino.

X—Is three-quarter blood merino.

No. 1, No. 2, etc., indicate the variations in purity of blood from the pure merino, from crossing with common sheep.

Coarse Wool—The product of sheep with but little trace of merino blood.

Braid Wool—The clip of bright-haired (lustrous) wooled sheep, almost pure, as Lincoln, Cotswold and Leicester.

STAPLE.

Wools are classified according to staple into clothing wools, combing wools and delaine wools.

Clothing Wools—Wools to be carded.

Combing Wools—Wools to be combed so as to leave the fibres parallel.

Delaine Wools—Practically combing wools of merino blood, and may be called fine (X and above), or medium (half-blood).

Felting Wools—The semi-annual clips of portions of Texas and California are sometimes so designated.

Noils—The refuse, short-stapled wool resulting from combing.

The classification under quality given above refers more especially to clothing or carding wools. Delaine wools may be classified into: Fine delaine, medium delaine and low delaine.

The fine delaine is about equal in fineness to the X grade or three-quarter blood merino carding wool. The medium delaine is about equal to No. 1 or half-blood merino carding wool. The low delaine is about equal to one-quarter blood merino in fineness.

Probably the most important characteristic of wool is its fineness. In the finest merino wools, 1,200 fibres may be laid side by side within one inch. Southdown wool is about double the diameter of the finest merino wool. In the average merino wool, about 1,200 fibres are required per inch. In the Southdown 850, while in the Cotswold and other long wools, about 600 are required per inch. The fineness of the wool varies in the different parts of the fleece and, consequently, each fleece is sorted by the manufacturer into several grades. In the majority of cases, the shoulder wool is finer than that from the sides, which in turn is finer than that from the hip. The belly wool is almost invariably finer than that from other parts. In practice, the fineness of wool is determined by experts by mere handling. Fleece is readily torn to pieces and the several grades depending upon fineness are thrown into separate piles, a way the distinction made in the fleece of picklock, XXX, XX, and X disappear.

If we examine a wool fibre, we will find that instead of being straight, it is wavy. This is known technically as crimp. While not an absolute guide, in general the number of crimp determines the fineness of fibre. In the finest pure merino wool there are about thirty crimps to the inch, while in the Southdown wool there are about twelve crimps to the inch. In the long wools the crimp is so slight as not to be considered. One can thus determine the fineness of the wool by counting the number of crimps per inch, and by a little practice we may appreciate the fineness without stopping to count the crimps. Devices have been invented, determining rapidly the number of crimps in the fibre. If one had a steel rule one inch long, on one side of which are twenty notches, and should place it along side of the wool fibre in which the notches correspond with the notches, he will note at once that the crimps correspond to the inch. By having a series of these rules, varying from ten notches to thirty or thirty-five notches per inch, one can readily determine the number of crimps in different grades of wool.

I take it that the best wool is that which will wear the longest for given weight. Doubtless this is largely dependent upon fineness but it is also dependent upon other circumstances, themselves depending largely, perhaps, upon fineness, but not necessarily so. Two of these properties are strength and elasticity. It is not only important that the fibre should be strong for its size and weight, but also that it should be capable of being stretched without breaking and after being stretched that it will return to its former condition. Rubber and putty can both be stretched, but only the former is elastic.

Our knowledge of the properties of American wools is largely dependent upon the elaborate investigations made by Professor McMurtrie and published in the report of the Department of Agriculture in 1886, and having determined the strength and elasticity of different samples of wool, the following conclusions were reached by Professor McMurtrie:

1. Fibres taken from the shoulder having common diameter and equal weight are considerably stronger than the average for the fleece.
2. The shoulder is therefore the most valuable part of the fleece by weight.
3. The relative economic values of the different parts are as follows, from greatest to least: Shoulder, side, hip, belly.
4. Fibres taken from the side closely approximate the average for the entire fleece.
5. The belly is much the least valuable part of the fleece.

Only five different breeds of wool were examined by Prof. McMurtrie, who was led to the following conclusions:

1. Southdown wool is much stronger than that of any other of the breeds considered.

2. It is consequently more valuable, pound for pound, for manufacturing purposes, where only the weight of the goods is to be taken into account.

3. If the manufactured goods are made of the same weight, those composed of Southdown wool should be much stronger and more durable for the same cost.

4. If all are to be of equal strength the Southdown fabrics will be considerably lighter and cheaper than others, allowing greater profit provided the wool is produced at the same price per pound.

5. Cotswold wool is the weakest, requiring more weight for equal strength.

6. From these averages the wools of the five breeds rank in economical value as follows, from greatest to least: Southdown, Oxforddown, Merino, Lincoln, Cotswold.

7. In point of strength, Merino wool closely approximates the average value for the five breeds considered. Its economic value would therefore be a mean between those of the Southdown and Cotswold.

Having made this hasty and somewhat imperfect review of the structure and properties of wool, we are now in a position to judge sheep.

In judging sheep for mutton, we practically take into consideration the same factors that we do when we judge cattle for beef. It is more difficult to judge the sheep for mutton than it is the steer for beef because the form is covered up by the fleece. We must judge the former by feeling, rather than by seeing.

In judging for wool, we pay less attention to form and consequently meat product and more to the wool. In judging the wool, three things are to be considered: The quantity, the quality and the condition. The quantity of wool will depend upon the length of the staple, the density of the wool, in other words the number of fibres per square inch. The number of fibres varies greatly with different breeds of sheep, with different individuals of the same breed, and even in different proportions of the same fleece. As heretofore indicated, the best wool will be found on the shoulder, sides and hip. The fleece should, therefore, be opened at these points in viewing the wool. It is also important to determine the evenness of the different parts of fleece, both with regard to length of staple, density of fibre and fineness.

The quality of the wool may be determined by its fineness, its softness, and by the amount of yolk or oil that it carries, the finer wools carrying the greater amount of yolk. The function of this yolk for the sheep is not only to keep the wool clean as heretofore mentioned, but also to keep the wool from felting on the sheep's back. If, for any reason, the supply of yolk should fail, the friction of the fibres would cause them to be felted together and the fleece would be spoiled. The finer the wool, the greater the tendency to felt, consequently, the greater necessity for yolk. The amount of yolk that a fleece should carry has been one of the debated questions among sheep breeders for many years. Doubtless the yolk may be excessive, but the importance of plenty of yolk in the finest wooled sheep cannot be doubted.

The condition of the wool is determined by its brightness, its strength and its cleanliness.

ORIGIN AND NATURE OF SOILS.

By W. DAVID GIBBS, Assistant, Professor of Agriculture, Ohio State University, Columbus, Ohio.

Nothing is more common than the soil under our feet. We walk over it every day of our lives; and yet how many of us stop to consider it? Where does it come from? How was it formed? And what is its use?

To the mind of the average person the soil is nothing more than mere dirt; something that is essentially unclean and unworthy of notice, much less of careful study and investigation. In recent years science has done much to dignify and make beautiful and interesting, things that were commonplace and insignificant. The growing plants, the beautiful blossoms, the luscious fruit, used to be considered commonplace and uninteresting, until science revealed the wonderful complexity and beauty of nature's laws.

The substance water is not, in itself, interesting. We know that it is heavy; that it is wet; and that it is necessary to life; and here our knowledge ends; but when science explains that water is composed of two invisible gases, the union of which forms the substance which we see and feel, and that these same two gases are found everywhere; that we could not live without breathing one of them; that they enter largely into the composition of all plants and animals, then we are interested, and the commonplace substance has a higher and broader meaning. So it is with the soil; the searchlight of scientific investigation has revealed new and interesting facts about the very dirt which we scrape from our shoes; our eyes have been opened, and we find the subject full of interest and worthy of careful study and investigation.

If you take up a handful of soil and examine it carefully you will see many mineral fragments, which look like small stones. That is what they are. All soils are composed very largely of pieces of stone. In a gravelly soil these pieces are large, some of them good sized pebbles, or even larger, possibly boulders several feet in diameter. If you examine a handful of clay you apparently do not see mineral fragments; but under the microscope this same clay looks like sand; and when measured these particles are found to be one-thousandth of an inch across or less. In fact, soils are composed, mainly, of these particles of varying sizes, larger in gravel or sand, and smaller in clay or loam.

The fertility of a soil depends largely upon the size of its particles. The mineral food of plants (the portion of the plant which remains as ashes after it is burned) is formed in the soil by the dissolving of the mineral fragments. Naturally, which will dissolve more rapidly, gravel or fine sand? Why will pulverized sugar dissolve more quickly than rock candy? Because its particles are finer and the liquid has more surface to act upon. Thus fine soil dissolves faster than a coarse one, hence plant food is formed more rapidly. Again, take two boxes of the same size with porous bottoms and fill one box with coarse gravel and the other with fine sand and pour water through them. Which will retain more water? The sand you say at once. Hence a fine soil holds more water than a coarse one.

But soils contain something more than broken fragments of worn and weathered rock. If we heat a sample of soil to a red heat we find that, after cooling, it has lost weight. This loss was partly water and partly organic matter. All of our soils contain large quantities of decayed and decaying plants. This decayed material gives to the soil its dark color. Muck soils are dark colored because they have a large amount of decayed swamp grass and weeds. Clay soil has, among its very fine particles, a small quantity of silicate of aluminum which gives it its sticky or plastic quality; loam soils have more or less of this same sticky material.

The importance of soil to animal and plant life cannot be estimated. Without it we could not exist; all forms of trees and all kinds of crops, would perish and all forms of animal life, including man, would perish with them: only a few mosses and lichens would remain to tell the tale.

WHAT ARE THE USES OF THE SOIL?

First—It is an immense workshop in which chemical and biological changes are constantly going on. The minute soil particles, or rock fragments, are continually being dissolved and made ready for hungry plant roots. Do you know that the soil is the home of a vast army of living creatures? We never see them, they are too small. They are the lowest form of life—simple one-celled plants, in the shape of spheres, ovals or short rods. How small are these denizens of the earth? In tranverse diameter one twenty-five thousandth of an inch is a common measurement. Increase the height of the ordinary man one thousand times and his head would be over a mile above the earth, yet one of these little creatures, under the same magnification, would have plenty of room to dance up and down in the film of water between two plates of glass pressed firmly together; from one hundred to two hundred and fifty of them placed side by side would make the thickness of an ordinary sheet of paper. These little fellows are continually at work causing decay of vegetable matter in the soil and thus making plant food. They are among the farmer's best friends.

Second—The soil is a great store house of water. If we always had plenty of moisture in our soils we would have good crops. The soil acts as a large sponge to absorb water and hold it for the use of crops.

Third—The soil is a home for plants; it affords a place in which they may live and grow.

Where does soil come from? How is it formed? All soils are formed from rock. Geologists tell us that at one time the surface of the earth was covered with nothing but solid rock and water. Now how was the rock changed into soil? Rocks decay when exposed to the weather; freshly quarried stone has bright and angular surfaces, while stone that has been exposed to the action of rain and freezing looks dull, and the edges are rounded. All rocks absorb water; even the hardest granite will absorb four-tenths of a pound for each one hundred pounds of rock. When the water in the stone freezes the ice expands, and breaks off small pieces of stone. Rains come and wash this material away and at the same time wear away the surface of the rock. It does not seem credible that running water could wear away stone, and when we ride through the Grand Canon of the Arkansas river in Colorado and see those solid granite walls extending almost straight to the skies for hundreds and hundreds of feet, we are slow to believe that the little river at our feet in its rush through the dark and narrow gorge has, little by little, cut its way through this solid wall of adamant. It fills us with awe to think of the centuries and centuries, the countless ages, that it has taken to accomplish this work. Running water is a good soil former and soil mover. Every year the Mississippi carries into the Gulf of Mexico seventy-two sections of land four feet deep.

Glaciers are another important agency in soil making and distribution. Whenever the climatic conditions of a country are such that more snow and ice is formed in winter than melts in summer this surplus must accumulate, year by year. After a while this pile of ice and snow becomes so deep and heavy that a great pressure is exerted on the lower layers and the ice begins to flow from underneath. The additions on the top of the pile increase the weight and cause the flow to continue. This was precisely the condition of affairs over northern regions in earlier geologic times. This ice flow extended down over the northern portion of the United States as far as the Ohio river, but did not extend over the southeastern, and a portion of

the eastern, part of our state. As this ice flow advanced it ground up and pulverized everything in its path. It fact it is claimed by some authorities that the great lakes were scooped out by this gigantic ice flow. When the ice sheet reached down into our warmer climate it began to thaw. As it thawed, and receded, vast quantities of soil, boulders and debris were deposited. The region over which this deposit took place is known as the drift area, and the land over which it did not extend as the driftless area. Drift soil is the most fertile soil that we know, because it is deep and composed of a large variety of elements, while the driftless soil has only the elements that are to be found in the underlying rocks, which in many cases are near the surface. This is what makes the difference between the fertile regions of central, northern and western Ohio, and the hill country of the southeastern section.

We will look upon the soil then not as an inert, lifeless mass of dirt, essentially unclean and unworthy of thought or attention; we will think of it as a live and complex substance in which constant changes are taking place, as an immense kitchen in which food is made and prepared for plant roots.

We will remember that all soils are formed from rocks by the action of freezing and thawing, rain, running water and glaciers; that they are made up chiefly of particles of rock of varying sizes; that the fertility of the soil depends to a considerable degree upon the size of its particles; that the soil contains decayed and decaying vegetable matter and that this material gives soil its dark color and adds to fertility. We will also bear in mind that the soil is the home of countless numbers of minute creatures, too small to be seen, that are constantly at work causing decay of vegetable matter and making plant food.

We will not forget the importance of the soil. Animals, including all the higher forms, from the lowest one-celled protozoan to man; all depend upon plants for food, for life. Plants live upon and in the soil. Without soil all animal life and all higher forms of plant life would be impossible. The surface of the earth would be a bald and barren scene of desolation.

PRINCIPLES OF FEEDING.

By CHARLES W. BURKETT Assistant in Agriculture, Ohio State University,
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Much valuable information, regarding scientific principles of feeding, has resulted from the investigations of the Agricultural Experiment Stations, of this and other countries, within the last four decades. Up to that time feeding was carried on in a sort of haphazard way; now it is positively known that it rests upon well defined principles. These investigations have shown that materials are continually being consumed in the processes of life, and that food must be supplied to furnish new materials, in order that the ordinary functions of the body may be performed and that the body itself may be in a healthy and vigorous condition.

The animal body has various requirements and these requirements are met with the food which we furnish. The energy, the force used in the performance of work, the muscles, the heat, the milk, the nerve force are all maintained by the supply of food. The object is to furnish these nutrients for the body, in the best form to meet these requirements at the least cost. This is scientific feeding.

The animal feeds from plants, hence the materials needed by the animal body must come from the plants. The animal has not the power to convert one ingredient into another, nor can one kind of substance take the place of another. The ani-

mal can only convert plant ingredients into animal ingredients. And the fact is that the plant and animal composition is about the same when it comes to the substances that compose them. These substances are divided into five groups, as follows:

Water—In the animal the amount is from 40 to 60 per cent. while in plants it may be from 8 to 10 per cent. as in hay or grain, or as high as 80 or 90 per cent. in silage or roots.

The animal in eating plants takes up this water in the food, but it is of no more benefit to him than the water which he drinks.

Ash—Is the material that is left when the combustible part of the feeding stuff of the animal is burned away. The animal contains all the chemical elements that a plant does, besides sodium and chlorine, which the plant may not contain.

Fat—Both plants and animals contain this substance. When an animal feeds the fat of the plant is either stored up in the body as fat or burned to furnish heat and energy.

Carbo-hydrates—Found only in plants, not in animals, and includes starch, sugar, gum, fiber, etc. It is the largest part of our foods, and is stored up in the body as fat or burned in the system to produce heat and energy.

Protein—Is the name of the substance having nitrogen as the basis. This group is the lean, or "flesh producer", and enters prominently into the production of blood, milk, nerves, the organs, etc. It is the most important and expensive of the materials. It is found in both animals and plants. We read in agricultural papers and books about protein and carbo-hydrates, but do not understand the terms. So let us define them in simple terms.

Protein is that part of a food that goes to make up the muscles, the flesh, the blood, skin, tendons, nerves, wool, milk, etc. These parts of the animal must be produced and are produced from this class of substances in the grain or hay. If the animal does not receive, in its food, the proper amount of protein for the processes of the body, it takes protein from its own flesh, and then we say, "that animal is growing poor." It is absolutely necessary, to supply the animal with a certain amount of this muscle or flesh-forming food. The fat and carbo-hydrates of the food go to lay up fat in the body or are burned in the system to produce heat. We put coal or wood in the stove, the fire is started and heat is produced. Now, in the same way, the fat and carbo-hydrates are taken in the system. The oxygen comes in contact and combustion takes place and produces heat in the body. Protein will do this to some extent, but the fat and carbo-hydrates of the food furnish this heating material in the main. We pay no attention to the water and ash, for the former is supplied in drink and the latter is, usually, with the exception of sodium and chlorine, found in sufficient quantities in the plants. Common salt is fed to furnish the sodium and chlorine.

This covers the basis of foods. We see, too, that protein serves a different purpose in the animal than fat or carbo-hydrates.

Another consideration is the relative amounts of these substances in a feeding stuff. This relation is expressed by the term "nutritive ratio," and nutritive ratio is simply the proportion of the digestible protein to the digestible carbo-hydrates and fat, and when these three substances—the "flesh formers," the fat and the "heat producers"—are in the right proportion, the ration is "balanced." If it contains too much of the "heat producers" and too little of the "flesh formers," or just the other way, the ration is "not balanced." What then is a "balanced ration?" A ration is balanced when the proportions of the protein, fat and carbo-hydrates are such as to insure the best use by the animal of all the food constituents contained in it. It is "unbalanced" when the proportions are such as to indicate a waste of one or another class of food compounds, because contained in quantities in excess of the needs of the animal.

From a large number of feeding experiments, it has been found that for certain purposes, certain amounts of protein, fat and carbo-hydrates are required daily to get the best results. For example, a milch cow weighing one thousand pounds, in full flow, requires daily twenty-four pounds of dry matter, which should contain two and five-tenths pounds of digestible protein, twelve and five-tenths pounds of digestible carbo-hydrates and four-tenths pound of digestible fat, which gives a nutritive ratio of one to five and four-tenths, or a food or combination of foods which furnishes one pound of digestible protein or the "flesh formers" to five and four-tenths pounds of the fat and carbo-hydrates or the "heat and fat producers."

Following is the nutritive ratio of a few of our prominent foods:

Corn Silage.....	1:12
Corn Stover.....	1:18
Clover Hay	1:5.7
Timothy Hay	1:16
Wheat Straw	1:48
Potatoes	1:16
Corn	1:10
Oats	1:6
Wheat	1:8
Corn and Cob Meal.....	1:9.7
Wheat Bran.....	1:4
Gluten Meal	1:2.5
Linseed Oil Meal.....	1:1.7
Milk.....	1:2.3
Skim Milk.....	1:1.7

You will observe that for a dairy cow there should be fed, daily, a ration containing one pound of digestible protein to five and four-tenths pounds of digestible fat and carbo-hydrates. Now, it is the practice of a great many farmers to feed just corn stover and corn, thinking this will make a "balanced ration." Glancing back to our table, we see that the nutritive ratio of corn stover is one to twelve and of corn one to ten, the requirement being one to five and four-tenths. Thus we see that the corn stover-corn ration is "too wide," there is not enough protein in the food. On the other hand, if bran were fed alone, we would be feeding a ration having too much protein and not enough fat and carbo-hydrates, hence bran is a "too narrow" ration.

Expressing it another way, we have:

1:12 | 1:5.4 | 1:4

One to twelve is too wide; one to four is too narrow. Hence, we must bring the two extremes together to meet the mean, and this is what is meant by compounding a ration. Foods vary much in composition, and we can usually make up a ration more cheaply by using three or more foods. With the foregoing thoughts in mind, let us make up a daily ration for dairy cows of one thousand pounds each. We give some rations here as examples:

A.

Formula.	Organic Matter.	Digestible Nutrients.		
		Protein	Carbo-hydrates.	Fat.
25 pounds corn stover	14.13	.50	8.35	.15
10 pounds bran	8.24	1.26	4.41	.29
4 pounds corn.....	3.50	.25	2.59	.20
Totals.....	25.87	2.01	15.35	.64

B.

Formula.	Organic Matter.	Digestible Nutrients.		
		Protein.	Carbo-hydrates.	Fat.
25 pounds corn stover	14.13	.50	8.35	.15
6 pounds bran	4.94	.25	2.65	.17
4 pounds corn	3.50	.45	2.59	.20
2 pounds gluten meal.....	1.70	.57	.66	.14
Totals.....	24.27	2.07	14.25	.66

C.

Formula.	Organic Matter.	Digestible Nutrients.		
		Protein.	Carbo-hydrates.	Fat.
12 pounds clover hay	10.16	.79	4.24	.20
20 pounds corn silage.....	4.18	.11	2.36	.13
4 pounds corn meal.....	3.40	.28	2.61	.13
4 pounds wheat bran	3.54	.48	1.65	.11
2 pounds gluten meal.....	1.85	.41	.88	.17
Totals.....	23.13	2.07	11.74	.74

D.

O. S. U. DAIRY RATION.

Formula.	Organic Matter.	Digestible Nutrients.		
		Protein.	Carbo-hydrates.	Fat.
45 pounds corn ensilage	11.5	.60	5.81	.29
8 pounds clover hay	6.8	.53	2.82	.13
2 pounds corn	1.8	.16	1.31	.07
3 pounds bran	2.7	.35	1.23	.09
2 pounds gluten meal.....	1.8	.56	.88	.17
Totals.....	24.6	2.10	12.05	.75

Horses, hard at work, need a ration about as narrow as dairy cows, but it should not contain so much rough food, and more grain should be fed. During winter time we get good results by feeding our horses the following ration :

Cut corn stover—what they will eat; seven and one-half pounds of bran; seven and one-half pounds of corn-cob meal and oats.

In summer and other seasons, clover or timothy hay can be substituted for the corn fodder.

Pigs need a food containing but little fiber and rich in the "muscle formers." There should be a distinction between fattening and growing animals. For fattening pigs or hogs there is possibly no better food than ear corn, but growing pigs and calves need the protein substances. Pasture grass is good for both.

Calves should be fed corn and hay with milk, for milk alone is too narrow. Hay cannot be fed to pigs but shorts or meal can.

Following are two rations for pigs as recommended by Professor Hunt, the quantities being the daily amount for each one hundred pounds of live weight.

A.

CORN-SHORTS-MILK RATION FOR PIGS.

	Dry Matter.	Digestible Matter.	Digestible Protein.
Corn, 2.5 pounds	2.23	1.92	.22
Shorts, .5 pound	0.44	0.33	.05
Milk, 7.5 pounds	0.71	0.71	.23
Totals	3.38	2.96	.50

B.

CORN-SHORTS-GLUTEN-MEAL RATION FOR PIGS.

	Dry Matter.	Digestible Matter.	Digestible Protein.
Corn, 2.5 pound	2.23	1.92	.22
Shorts .5 pound	0.44	0.33	.05
Gluten Meal 1 pound	0.91	0.79	.26
Totals	3.58	3.04	.53

This covers the subject as fully as this article will permit. In closing we want to emphasize this point that feeding by guess work has passed, and, to get the best results, we must use the best methods and best judgment in the care of our animals and the selection of food for them.

HINTS TO PURCHASERS OF COMMERCIAL FERTILIZERS.

By CHAS. E. THORNE, Director of the Ohio Agricultural Experiment Station,
Wooster, Ohio.

Farmers purchase fertilizers for the purpose of conveying to their fields three chemical elements or elementary compounds, nitrogen, phosphoric acid and potash, experience having shown that most soils become partially exhausted of one or all of these substances long before any deficiency is shown in the lime, magnesia, iron, etc., which are equally essential to plant growth.

The trade name under which nitrogen is sold is ammonia, which is a chemical compound of nitrogen with hydrogen, just as phosphoric acid and potash are similar compounds of phosphorus and potassium with oxygen. It is doubtful, however, whether plants feed upon nitrogen in the form of ammonia. It is more probable that in the great majority of cases ammonia compounds are broken up and the nitrogen becomes associated with oxygen as nitric acid before it can serve as a plant nutrient. The familiar experience that nitrate of soda, in which the nitrogen is thus combined with oxygen, is a more effective fertilizer than sulphate of ammonia, supports this view.

In the ready mixed fertilizers sold in Ohio, however, the nitrogen, although labeled "ammonia," on the fertilizer sack, is actually carried neither in the form of ammonia nor of nitric acid, (nitrate) but in that of "organic" nitrogen, a form still less available, usually, than either nitric acid or ammonia. Since ammonia is approximately 80 per cent. nitrogen, an analysis showing, say 5 per cent. "ammonia," would indicate about 4 per cent. actual nitrogen.

The basis of the nitrogen in practically all these fertilizers is the refuse from the great slaughter houses—refuse which a few years ago was entirely wasted, but which is now carefully saved and which has become one of the large items of profit in these establishments.

The first item of saving is the blood, which is collected and dried. In this condition it shows by analysis 10 to 13 per cent. of nitrogen, equivalent to 12 to 16 per cent. "ammonia," and is sold at so much per unit of ammonia; that is, if the market quotation were one dollar and a half per unit, a ton of dried blood analyzing 12 per cent. would cost twelve times one dollar and a half, or eighteen dollars.

The next item of saving is the bones, which are most carefully utilized. Out of each shank is cut a piece about six inches long which is polished and sold to the makers of bone handles, etc. These shin bones are quoted in recent markets at thirty-seven to forty-seven dollars per ton. The thigh bones are also carefully saved, bringing as much as ninety dollars per ton. Some of the scraps go to the glue factory, and after having the glue extracted by long cooking are ground into steamed bone meal, while those not adapted to any of these purposes and which can be freed from meat are ground into raw bone meal.

Ground raw bone should contain $4\frac{1}{2}$ to 5 per cent. ammonia and 22 to 23 per cent. phosphoric acid; ground steamed bone, $3\frac{1}{4}$ to $3\frac{1}{2}$ per cent. ammonia and 27 to 28 per cent. phosphoric acid.

The phosphoric acid in the steamed bone seems to be slightly more available than that in raw bone. In both forms a considerable proportion of it is insoluble in water, but as it gradually becomes soluble by decay in the soil the insoluble acid of bones or animal matter is considered more valuable than the insoluble acid of Carolina rock, which decays much more slowly than animal matter.

After the blood and bones have been taken care of there remains a large amount of refuse in the form of scraps of meat and bone with more or less fat attached. These are thrown into large tanks and the fat is extracted by cooking. The residue is pressed, dried in large cylinders, provided with apparatus for stirring, ground and sold to the fertilizer mixer as "tankage."

This tankage constitutes the larger part of the slaughter house fertilizer material, the total product exceeding that of blood and bones combined. It is quite variable in composition, analyzing from 6 to 10 per cent. ammonia and from 5 to 14 per cent. phosphoric acid. The standard grade, which occupies the same place in the fertilizer market that No. 2 wheat does in the grain market, is "9 and 20" tankage; that is, a tankage analyzing 9 per cent. ammonia and 20 per cent. "bone phosphate of lime," this bone phosphate representing the compound of about 46 per cent. phosphoric acid with 54 per cent. of lime which is found in bones, and the term having come into use, like that of "ammonia" as a carrier of nitrogen, for the purpose apparently of magnifying the actual plant feeding contents of the fertilizer. This standard tankage therefore, would contain about 7 per cent. nitrogen and 9 per cent. phosphoric acid. In this condition it shows a larger proportion of nitrogen than farmers usually think it profitable to use, and, moreover, the material is in much the same condition as raw bone, as it must decay in the soil before the plant can absorb it.

For both these reasons the fertilizer mixers are in the habit of adding acid phosphate to the tankage, this acid phosphate being the phosphatic rock which is found in such large deposits in South Carolina, Florida, Tennessee and elsewhere, and which is mined, ground into fine powder and treated with sulphuric acid, this treatment having the effect of rendering the phosphoric acid more soluble.

Acid phosphate should contain about 14 per cent. of soluble phosphoric acid with one or two per cent. insoluble. The chief market for it is in Baltimore, where it is now sold at from eight to ten dollars per ton, owing to the quantity and to whether it is sold in bulk or in bags.

When potash is desired, a little muriate of potash is added, this muriate carrying 48 to 50 per cent. actual potash, and being at present the cheapest carrier of potash on the Ohio market.

Out of these three materials—tankage, acid phosphate and muriate of potash—are probably compounded 99 per cent. of the ready mixed fertilizers sold in Ohio, the work of the so called fertilizer manufacturer being simply to mix them together in varying proportions, so as to give the different analyses which he desires.

A year ago we ascertained the prices and the claimed composition of a large number of brands of fertilizers sold in the State. These ranged from a simple acid phosphate, retailing at eighteen dollars per ton, to mixed fertilizers selling at thirty dollars and upward. The average composition as shown by the analyses of the Secretary of the State Board of Agriculture, was 2.34 per cent. ammonia, 10.21 per cent. available and 2.07 per cent. insoluble phosphoric acid and 1.58 per cent. potash, and the average cost to the farmer was twenty-six dollars per ton. On a larger scale we have examined the statistics of fertilizers bought by the farmers of Ohio, as reported to the township assessors, and compared these with the valuations as reported by the Secretary of the State Board of Agriculture, and we find that the average cost, over the State at large for 1894, was twenty-six dollars per ton, and the average valuation about twenty-five dollars.

FERTILIZER VALUATIONS.

In making these valuations it has been customary for those charged with the fertilizer control in the different states to ascertain the price at which ammonia, phosphoric acid and potash were being sold at retail in standard fertilizers. For instance, if acid phosphate containing 14 per cent. or two hundred and eighty pounds available phosphoric acid per ton, were sold at eighteen dollars, the cost of the phosphoric acid would be about six and one-half cents per pound; if muriate of potash, analyzing fifty per cent. actual potash, were sold at sixty-five dollars per ton, the cost of the potash would be six and one-half cents per pound, and in a mixed fertilizer of the average composition given, the cost of the ammonia would be over twenty cents per pound as shown in the following table:

Phosphoric acid, available, 10.21 per cent. 204 pounds per ton at 6½ cts.....	\$13.26
“ insoluble, 2.07 “ 41 “ “ 2 cts.....	.82
Potash 1.58 “ 32 “ “ 6½ cts.....	2.08
Ammonia 2.34 “ 47 “ “ 21 cts.....	9.87
Total	\$26.03

In fact, ammonia was regularly valued, in the Ohio estimates, at sixteen to seventeen cents until within a year or two past, and is still valued at that rate in some other states, and six and one-half cents was the valuation of phosphoric acid and potash up to 1894.

Those informed regarding the actual cost of fertilizing materials have known all along that these valuations, especially for ammonia, were excessive. For instance, our Experiment Station has been buying nitrate of soda for years, for its fertilizing experiments, at prices which represented a cost for ammonia of about fifteen cents per pound, yet nitrate of soda is everywhere acknowledged to be the most effective carrier of nitrogen in common use as a fertilizer; while the chief reason for its non-use in Ohio fertilizers is its high cost, in comparison with slaughterhouse “ammoniates,” as tankage, blood etc., are called.

In fact, one of these tankages has been offered in the Ohio market for several years at a price which would bring its cost to the average Ohio farmer, in single 200 lb. sacks, freight paid to his station, to less than twenty dollars per ton. This tankage has been analyzed several times by the Secretary of the State Board of Agriculture, and runs over 7 per cent. ammonia and over 13½ per cent. phosphoric

acid, about 8 per cent of which is available. Moreover, acid phosphate has been sold at retail at prices which would reduce the cost of its available phosphoric acid, at the average Ohio farm, to five cents or less per pound, and the Experiment Station has bought potash for several years in the muriate in less than ton lots at five cents per pound or less, freight paid. Allowing five cents for the available and only two cents for the insoluble phosphoric acid in the tankage referred to, the total value of the phosphoric acid would be ten dollars and twenty cents, leaving less than ten dollars as the cost of the ammonia, or about seven cents per pound. These, it must be remembered are retail, not wholesale, rates. If a neighborhood of farmers were to join hands and purchase their fertilizing materials by the carload a much greater saving might be made. For instance, acid phosphate is offered in Baltimore this winter at eight dollars per ton in bulk or eight dollars and seventy-five cents in sacks, in carload lots. The freight to Ohio points is about three dollars and fifty cents per ton in carloads, making the total cost in Ohio about eleven dollars and fifty cents to twelve dollars and twenty-five cents per ton. Ground "9 and 20" tankage is offered in Chicago at eleven dollars per ton, or twelve dollars in sacks, in carloads, and the freight to Ohio is about two dollars, making a total cost of thirteen to fourteen dollars. Muriate of potash is offered at thirty-nine dollars per single ton in New York, equivalent to about forty-four dollars in Ohio. Now, suppose you were to purchase and mix as follows:

One carload, say 15 tons, tankage at \$14.00	\$210 00
One " " acid phosphate at \$12.25.....	183 75
Two tons muriate of potash at \$44.00	88 00

Total 32 tons, costing \$481 75

This would be about fifteen dollars and five cents per ton.

But, you say, this has yet to be mixed. So it has, but the mixing is a simple matter. At the Experiment Station we have been mixing our fertilizers in a small way for years. At present we are using a small barrel churn, revolving end over end, and having slats across the inside to scatter the material. For mixing larger quantities one of the large churns which are to be found in some of our abandoned creameries would be the ideal thing, but in default of that, a box can be made to revolve on the same principal, at a cost of a few dollars. A recent bulletin of the Rhode Island Experiment Station illustrates such a mixing box. With such a mixer the materials named can be mixed as thoroughly as is done by any professional fertilizer maker, and at a very small cost. Sixteen dollars per ton would amply cover all the cost of purchase of materials and mixing such a fertilizer as I have described. It would analyze over 4 per cent. ammonia, 9 to 10 per cent. available phosphoric acid and 3 per cent. potash, and its ammonia, phosphoric acid and potash would each cost less than four and one-half cents per pound.

Many farmers have a fear that acid phosphate may have an injurious effect upon the soil, and I have little doubt that if that material were to be used alone for a series of years it would cause such a draft upon the ammonia and potash of the soil that eventually greater sign of exhaustion would be shown than if no fertilizer had been used. But if acid phosphate be used in connection with both ammonia and potash, in a complete fertilizer no more injurious results will follow its use than that of dissolved bone black, for instance, which is simply an acid phosphate made from bones instead of from Carolina rock.

So far as the phosphoric acid is concerned, our experiments show no practical difference between that in acid phosphate and that in dissolved bone black, and both forms will probably produce a larger immediate result than an equal weight of phosphoric acid in raw bone meal.

The assessors' returns show that about forty-five thousand tons of commercial fertilizers are purchased yearly in Ohio. Our investigations indicate that Ohio farmers are paying for these fertilizers not less than a quarter of a million dollars annually more than their necessary cost, but it must of course be understood that the prices I have given are cash prices, and that if the farmer wishes to buy his fertilizers on credit he must expect to pay the cost of carrying his paper.

In the following table is given the average percentage of fertilizing constituents in a few of the most common fertilizing materials, nitrogen being estimated as "ammonia" for ready comparison with fertilizer brands.

Material.	Fertilizing constituents.		
	Ammonia.	Phosphoric acid.	Potash.
Nitrate of soda.....	20		
Sulphate of ammonia	30		
Dried blood	15	1.9	
Tankage, "7 and 30".....	7	13	
" "8 and 20".....	8	9	
" "9 and 20".....	9	9	
Raw bone meal	4.5	22	
Steamed bone meal	3.5	27	
Acid phosphate		14	
Dissolved bone black.....		16	
Untreated Carolina rock.....		25	
" bone black.....		28	
Linseed oil meal, old process	6.6	1.6	1.4
" " new process.....	7	1.8	1.4
Cotton seed oil meal	8.6	3.1	1.8
Wheat bran.....	3.2	2.9	1.6
Muriate of potash.....			48
Sulphate of potash, low grade			25
" " high grade.....			50
Unleached wood ashes		1.7	5.2
Leached wood ashes		1.5	1.3

It will be observed that the total phosphoric acid in the untreated bone black and Carolina rock runs much higher than in the dissolved bone black and acid phosphate; but experience has shown that in the untreated materials the phosphoric acid becomes available so slowly that it is usually more economical to pay the difference for the acidulated phosphates.

The phosphoric acid in ashes is probably in much the same condition as that in untreated bone and rock, and the potash in leached ashes is probably in a difficultly soluble form.

At current prices ammonia cannot be bought in nitrate of soda or sulphate of ammonia in small quantities at much less than twelve and one-half to fifteen cents per pound, including freight, nor in dried blood at less than eight to ten cents; but in tankage and bone, both ammonia and phosphoric acid may be bought at five cents or less, and potash in the muriate at the same rate.

On this basis the comparative value of these different materials for fertilizing purposes may be closely approximated, remembering always that for complete effectiveness they must be mixed in such proportions as to carry similar quantities of each of the three most essential constituents of fertility, before direct comparison can be made.

DISEASES OF THE PLUM AND CHERRY.

By AUGUSTINE D. SELBY, Botanist, Ohio Agricultural Experiment Station,
Wooster, Ohio.

The varieties of cultivated plums and cherries are generally familiar. All of them, including the wild sorts, are nearly related species—all belong to the genus *Prunus*. As to fungous diseases, the troubles of the plum and cherry are practically the same, and therefore admit of treatment together. A reason for this identity of diseases may be found in a previous statement. Put in another form, it would read, fungi of like species live upon like sorts of host plants, that is, upon nearly related botanical species. The common troubles are, black-knot, rot, shot-hole fungus or leaf spot, mildew and root galls.

BLACK-KNOT.

Black-knot probably stands first in destructiveness with those who grow cherry and plum trees in fence corners, but for the thorough going Ohio orchardist it is a disease less dreaded than rot. Rot of the fruit is feared by the latter much more than black-knot, and is much more difficult to deal with. These observations are offered that a true conception of the question be not wanting. Black-knot may be conceded first place upon grounds of familiarity. It is a contagious disease and certainly destroys many trees every year. Moreover, the statutes of Ohio require that the diseased parts of plum and cherry trees affected with black-knot shall be cut away and destroyed by fire. Furthermore: "That it shall be unlawful for any person to keep, or permit to be kept upon his premises or upon premises under his charge or control as agent, lessee or otherwise * * * any affected part of any cherry, plum or prune tree infected with the contagious disease known as black-knot." The penalty for non-compliance, with notice of fruit commissioners to destroy the same, is, upon conviction, a fine of not exceeding one hundred dollars. The law and description of the disease will be found in Bulletin 72 of the Ohio Experiment Station.

Black-knot comes upon cherry, plum and prune trees, but not upon blackberry, raspberry, peach or apple plants so far as we know at present. All varieties of plums or cherries whether wild or cultivated are attacked by the black-knot. Some sorts are more susceptible than others, but none are immune from it. Sweet-cherry trees become diseased if continuously exposed to infection by the spores produced upon surrounding diseased trees. The injuries caused by black-knot are well known. Many persons have had the Morella cherry and Damson plum all swept from their premises. The damage is so great as to call for thorough measures against it.

These knots are the result of the growth of a fungus upon the diseased branch. This fungus is called by botanists, *Plowrightia morbosa* (Schw.). Insects are harbored in the knots but are not responsible for them in any way. Each knot has its beginning in a spore or in spores which germinate upon the branch and penetrate the bark. The fungus grows at the expense of the branch or twig. It produces during summer a sort of summer spores which spread the disease. The knots may be observed as early as April, and are commonly very evident in May. The portion of the branch beyond the knot is soon killed by it. The knot is really wound cork which is formed by the tree and not by the fungus.

During winter, another sort of spores, which we may call winter spores, are formed in the exterior of the last season's knots. The winter spores are formed in little sacs (of which there are many) within spore cases. The spore cases show as



PLATE I. BLACK-KNOT OF CHERRY (*Plowwrightia Morbosa*.)

1. Young knot of Cherry May 16, two-thirds natural size. 2. An old knot in fork, two-thirds natural size. 3. Section through No. 1, showing summer spores. 4. Section through a spore case. 5. Spore sacs containing winter spores. 6. Spermogonia.

small elevations upon the outside of the knots. These winter spores mature in mid-winter and are scattered by the opening of the spore cases in early spring. There is sometimes a pink incrustation upon the knots. This is another fungus which lives upon the black-knot fungus.

REMEDIES FOR BLACK-KNOT.

Since the spores of black-knot live over winter in the previous season's knots and are scattered in early spring, the spread may be checked by *cutting off all old knots and burning them. This must be done before March of each year to be effective.* It is a good plan to cut off knots whenever they are observed. This method of prevention is sufficient to keep down the ravages of the disease. It is neglect that permits black-knot to carry off plum and cherry trees. Where only one or two large branches are affected with black-knot, the knot may be cut out clean and the wound painted. Where the large branches are severely attacked the whole tree should be cut down *and burned.* Coal oil applied to the knots may kill the fungus, but is expensive treatment. Spraying will also prevent the knots to a great extent, and is also more expensive than the simple remedy of cutting and burning the knots.

ROT OF PLUMS AND CHERRIES.

Plums and cherries rotted very badly during the summer of 1896. The hot, moist weather supplied just such conditions as are required by the rot fungus. It is the rot fungus, *Monilia fructigena* Pers., however, and not the weather that



PLATE II. ROT OF CHERRY.

This shows a healthy and a rotten cherry.

causes the rot. The weather furnishes the conditions for the fungus. The same fungus produces rot of peaches.

This fungus lives over winter, largely, in the old, rotted, mummy fruit, which usually remains upon the trees. No method of prevention will succeed unless these

mummies are removed and destroyed. If allowed to remain till spring they should be burned; in fall it is perhaps sufficient to drop them upon the ground. Removal of rotted fruit during the ripening period is a tedious process, yet fairly successful. In a small experiment in spraying plums, made at Gypsum last season, the rot appeared three weeks earlier upon the fruit of the unsprayed trees than upon the sprayed ones. Bordeaux mixture was used in the spraying, while the treatment was stopped in June. From this, and trials made by others, it seems that spraying with fungicides may be useful in preventing rot. As yet this remedy has not passed the experimental stage. It must be remembered that the foliage of the cherry will not bear as strong sprays as that of the plum. Upon cherries, therefore, only half the strength of Bordeaux mixture for plums and apples may be used with safety. The bulletins of the Experiment Station give details of the methods of spraying.

LEAF SPOT OF CHERRY—SHOT-HOLE FUNGUS OF PLUM.

The leaves of plums are frequently perforated and have a shot-hole appearance. Such leaves have dead spots in them and drop off early. Often the plum trees lose



PLATE. III. SHOT-HOLE FUNGUS OF PLUM.

The diseased leaf is natural size. The spores are magnified 330 times. Below the spores is shown the cover to an aceroulus or spore bearing spot in the leaf.

all foliage in July or August. They afterwards put forth new leaves and blossom again. If such trees are in bearing, the plums fail to ripen properly and are sometime worthless. In a similar manner, the leaves of cherry trees are spotted and



PLATE IV. LEAF SPOT OF CHERRY.
A diseased leaf, natural size.

drop off. Commonly on the cherry leaves the shot-hole appearance is not so frequent. Both of these leaf diseases are fungus troubles and produced by the same fungus, *Cylindrosporum padi* Karst.

This disease is a very serious one and may be satisfactorily prevented by spraying with Bordeaux mixture. Two to three applications, beginning when the leaves are half grown and repeated at intervals of three weeks, will be found enough in

most cases. For cherries but half the strength of mixture may be used without injury to the foliage by the spray.

CROWN GALL OR ROOT GALL.

The crowns and roots of cherry trees sometimes have knots or galls upon them. The galls vary in size; sometimes they are more than an inch in diameter. Peaches suffer to a still greater extent from this crown gall. Pears and apples are likewise affected. Similar galls upon raspberry plants have been traced to eel-worms. It may be that the same agency has to do with those on the cherry. The disease appears to be capable of spreading from one tree to its very near neighbor. No trees affected in this manner should be received from nurserymen and all with the root or crown gall should be burned as soon as discovered.

EXPERIENCE IN CORN GROWING.

By JOHN BEGG, Columbus Grove, O.

In presenting this subject, I do not claim any superior knowledge over that possessed by those who have been all their lives engaged in the same business, but with all my experience in corn growing, I find that I can learn something new about the business every year; and by interchange of experience upon this and kindred practical topics we can all be benefited.

I believe it has been said that "Corn is King" among agricultural products in many sections of the country, and when we consider the many advantages attending its production, I am led to believe it is entitled to all the importance attached to it, for no other crop will give as sure a yield to the farmer under all conditions as will "King Corn." Neither can any other of the staple farm products be converted into so many different merchantable products as can this. If prices are so low when the crop is harvested as to be unremunerative, the farmer can convert his corn into beef, pork, mutton or whatever other kind of live stock product may best suit his fancy or circumstances; and when this is practiced it gives him a wider market for the products of his farm, insures better prices besides enabling him to retain the greater part of the fertilizing properties of his crop upon his farm in such shape as to be returned to the soil again. With many other of our products, such as wheat, potatoes, vegetables, etc., this cannot be done, but the producer is compelled to market them within a certain time or serious loss ensues. So then, in view of these facts, anything that may be said that will tend to facilitate the cultivation or increase the production and value of this product will be of value to the corn producers of the country.

Then let us briefly notice a few of the more important points connected with the production of this crop.

First, the soil should be as rich as can be obtained and when not so by nature should be made so by good husbandry. It should also be well underdrained, as corn will not grow or produce well upon land that is wet and sour. A rich, well underdrained clover sod is an ideal place for corn to grow and yield well. When this cannot be obtained, as has been the case with so many of us in recent years, a timothy or some other kind of sod should be used if possible. On our own farm we always plow up as much sod land for corn each year as possible. This gives a fresh loose soil easily cultivated and easily kept clean of weeds, and the decayed sod furnishes food for the growing plants that hastens growth at the right time.

The depth of plowing should be regulated according to the kind of soil. In black bottom land we plow from seven to eight inches deep, but on clay soils probably five or six inches. This plowing should be done as early in the spring as possible after the frost is out of the ground and the land becomes settled. I do not approve of late plowing where it can be avoided, as it does not allow the soil to pack as it should before planting, neither will it retain moisture in dry seasons as well as where plowed early. This was plainly seen in the summer of 1895 during the protracted drouth. After plowing, sod land should be gone over with a disc or spring tooth harrow often enough to cut it up fine so that a smoothing harrow or plank drag will make the surface perfectly smooth. Great mistakes are frequently made by farmers planting their corn before they get their soil in perfect condition, the yield being often affected by carelessness in this particular.

The time to plant is also an important consideration in producing a corn crop. Many farmers, in order to beat their neighbors, plant their corn before either the soil or atmosphere is in proper condition. Corn is a sub-tropical plant and must have a certain degree of heat and moisture to insure rapid growth, and when planted when the ground and air are cold, it germinates very slowly and sometimes not at all. But when planting is deferred until proper conditions are obtained, the seed will germinate rapidly, the corn will come up in five or six days and the growth will be much more vigorous and rapid than when planted too early in the season. On the other hand, when corn is planted very late, there is a liability of damage from early frosts in the fall, so that the farmer should endeavor to get his ground ready to plant at the proper time. This, in our latitude, is from the first to the fifteenth of May. Corn that is planted the first half of May will be much more likely to produce a good crop than when planted either earlier or later.

The selection of seed also requires a good deal of care and attention to insure success. Seed corn should always be selected either before the corn is cut, by going through and taking the best ears, or at husking time. The corn thus selected should be put in a place where it can be thoroughly dried before freezing weather comes. Corn that is thus properly dried and kept in a dry place during winter will scarcely ever fail to germinate quickly and produce a healthy plant, other conditions being favorable. Many a corn crop has been seriously damaged from no other cause than carelessness upon the part of the farmers in caring for their seed, and sometimes a difference of several bushels per acre may be seen, when corn is harvested, simply by the producers being careful in selecting a good quality of seed corn.

In planting, care should be taken to plant to as nearly a uniform depth as possible. When planting is done by hand, a little care and skill on the part of the workman will enable him to do this, and when drill or check-row planter is used, the depth is easily regulated by adjusting the machine properly. Corn that is planted in this way will come so evenly as to enable the farmer to begin cultivating much sooner than where some is planted deep and some shallow. When soil is prepared properly, two or three inches is as deep as corn should be planted.

I prefer planting in hills rather than in drills. Hill corn is more easily kept clean and can be harvested with much greater ease also, and, so far as my experience goes, the yield is just as large and ears as large and well formed as when planted in drills. Cultivation should begin just as soon as the plants are large enough to admit of it and be kept up continuously until the wheat and hay harvest interfere, when it should stop for the season. I have long practiced cultivating our corn once per week if possible from last of May till first of July, never cultivating any after harvest is over. There may be exceptions to this practice, but they are rare.

I prefer a cultivator with small shovels, three or four on each side. This, when rightly handled, stirs all the soil between the rows; can be run very close to the

small corn without damaging it, and leaves the surface comparatively level. It also destroys all weeds as well or better than any implement I have ever used. Cultivate deeper the first and second times while the corn is small, as the roots have not spread to any great extent and no damage will ensue. All subsequent cultivation should be more shallow as the corn will be larger and the roots spread over the spaces more. The number of cultivations must be determined by circumstances, but each cultivation should be thoroughly and carefully done. The main objects sought by cultivating are to break the crust, to prevent too much evaporation of moisture from soil and to destroy weeds.

I do not deem it necessary to "rip the ground up," as some farmers term it, as deep as it was originally plowed, when the corn is growing. I think more harm comes from such work than good to the growing crop. I also advise level cultivation rather than otherwise as it serves all the purposes that would otherwise be obtained and leaves the field in much better condition for whatever use the owner may want to make of it afterwards.

At sometime during the time of cultivation corn should be carefully thinned to a certain number of stalks to each hill. My practice has been to do this work after a rain when possible as the surplus plants can be removed at that time with less damage to the remaining ones. I thin to three stalks in a hill wherever I thin at all, but where four strong thrifty plants are growing in one hill, I let them remain as they will generally do very well in that way. This practice gives a beautiful stand, not so thick as to make the ears small and yet thick enough to give a good yield of corn. When this work is being done all weeds that have escaped the cultivator should be pulled out, as hand weeding is the safest and best way to keep corn clean after all. And when such methods as I have indicated are practiced, the farmer will generally be rewarded with a fair yield of corn; or he will at least have the satisfaction of knowing that the failure, if such it is, is not due to any neglect upon his part.

As to cutting and caring for the crop in the fall, I need say but little, as very little change has taken place in the methods employed during the last twenty-five years. I prefer letting corn mature well before cutting. Many farmers err in cutting their corn too soon and the result is either shriveled, or moldy corn. I cut it up in shocks twelve hills square, containing one hundred and forty-four hills each. Especially would I advise this method where fields are to be sown to wheat after cutting, but when corn is extremely heavy, or weather unusually wet, I would put it up in smaller shocks. In ordinary seasons, however, large shocks will keep just as well and are much preferable to handle in winter when fed to cattle as is done in many corn growing sections. Leaving corn on the stalk as practiced by many farmers is a practice not to be recommended at this time. Corn fodder when properly cared for is a most excellent feed for almost all kinds of stock and is an excellent absorbent also, and when left standing on fields and simply pastured in winter it is of little value to the farmer for either. Besides, when this practice is indulged in, there is greater loss to the fields from stock tramping over them while feeding upon the stalks than all the saving of labor gained by not cutting and caring for the crop in the proper way.

As to the care of fodder I will say nothing, as it has now become a separate subject and will be considered at another time. But in concluding this paper I would advise all farmers whose circumstances will permit to raise corn along with other crops the same as when prices were higher, and feed the products of the corn fields into some kind of growing stock whenever possible.

This will give you the advantage of an enlarged market for your corn crop and at the same time enable you to keep up the fertility of your farms with but little cost for commercial fertilizers. In fact, I believe the farmers who are still engaged in raising corn as one of their staple crops and are disposing of it in the manner

indicated above are doing much better, during these dull times, than are those who were induced to leave off their corn and live stock growing and go headlong into the production of some of the more perishable products of the farm and orchard. Especially is this true in sections where the soil and other conditions are suitable for corn and live stock and where the farmers have neither the knowledge or other requisites to enable them to compete with vegetable or fruit growers in more favored localities. So then, in this, as in all other lines of work, let us apply ourselves with diligence and study, not only our soil and other conditions but our own adaptability for the business, and by this diligence in study and perseverance in work we will succeed in realizing a fair profit from our corn crops though prices are seemingly against us at this time.

MASTER OR SLAVE.

By E. E. ELLIOTT, Morning Sun, O.

A strange thing in its power and workings is influence. We find it, moving in its mysterious way its wonders to perform, throughout all the realm of creation.

We find unlike, inanimate objects knit together by some cohesive force. It is a form of influence which scientists tell us is called attraction. We confine two gases in the same space—the one absorbs the other and completely changes its nature. We mix two or three ingredients together and bring them in contact with another; the result is a disastrous explosion.

Learned men may call these diverse phenomena by different names, but to us they may serve as illustrations of the workings and power of influence. We pass into the domain of animate creation and the same results are to be seen. Even man, gifted with reason and will, is attracted, controlled, repelled, and exerts like influence upon all with which he comes in contact.

It is not, however, to the general principle, but to one simple illustration of the power and action of influence that your attention is asked to-day. An illustration, too, that may well teach us how all things are bound together by the golden chains of mutual dependence.

On the one hand we have the farmer, on the other the soil. The Farmer and the Soil; their mutual power, their mutual relation. Which is, or should be, master, which the slave?

Of all the pursuits of the world's workers the calling of the agriculturist lies closest to mother earth. In their buying and selling, their strife and endeavors, others may forget their kinship with the soil; the farmer can never forget it. He is bound to it by ties which can never be severed. There is between them a covenant. He is in league with the very stones of his field. Not a day of his life passes but he is reminded that with the soil is bound up for him failure or success, sorrow or happiness.

To the born agriculturist there is a certain fascination linked with the soil. I believe in truth, it is inherent in the whole human family. As a friend once put it, "Nine-tenths of the people hope some day to own a farm to which they may retire to end their days." The universal desire of the American citizen is to possess a home. This desire is founded not so much in the bare walls and roof which compose the abode, as in the fact that with it go some square rods or acres of God's own earth which he may own, every foot of it, clear down to the center of the globe. This inborn love for the soil and everything connected with it is intensified

in the farmer. It satisfies every sense of his being. What to him are the perfumes of Cathay when o'er him steals the odors of the fresh plowed field or the aroma of the new mown hay?

"You ask him for the sweetest sound
 His ears have ever heard;
 A sweeter than the ripple's plash
 Or trilling of a bird;
 Than tapping of the rain drops
 Upon the roof at night;
 Than the singing of the pine trees
 On yonder mountain height;
 He will tell you these are tender,
 Yet never quite so sweet
 As the murmur and the cadence
 Of the wind across the wheat."

To such a one the love of the land appeals like an overmastering passion. For it the pioneers pushed into the wilderness with memory ever looking backward and hope ever leading on. For it the homesteader joined in the mad rush into the unknown land of Oklahoma. For it men have sailed the seas over and scaled the mountains and swam the rivers. It has ever been so since the days of Abraham and Lot and the children of Israel and the promised land, and so it will ever be so long as it shall be said, "There remaineth yet much land to be possessed."

Whence arises this peculiar attraction to the soil? It is not easy to explain. The simplest reason that can be given is the fact that men recognize in it material possibilities.

The soil is the source of all wealth, and no passion is so strong as that of greed for gain. Aside from this, and it may be but mere fancy, it seems to me that the ties which bind us to the soil are those of kinship. The farmer, more than all, recognizes the brotherhood of the soil, a communism of origin and purpose. The interchange of influence between the two is not, however, equally exerted. On the contrary, it seems that one must, for the good of both, in time become master of the other. If the farmer does not keep the soil where it properly belongs, under his feet, he will find he loses something of that divine spirit which is within him. The soil is ever of the earth, earthy—its tendency is downward. There is a popular idea that contact with the soil is to a degree degrading. It is assumed that the man who delves with pick or shovel, who handles the hoe or guides the plow is, because of his associations, a step below his fellow men. He may be respected for his integrity and worth, but the fact that he is a farmer or gardener or laborer is never forgotten. His calling is referred to in an apologetic way, and he is continually made to dwell in the vale of humility. We cannot claim that this is wholly unjust. The farmer as a class is not the most refined and cultivated of men. His manners are often ungraceful, his language uncouth, his bearing boorish. Worst of all, he usually doesn't care to have it otherwise. He would rather be a king among his hogs, although himself should class as a hog among kings. He is content to let his mind, his ambitions, his will remain chained to the low level of the soil. "The grossness of its nature has had weight to drag him down." Instead of mastering he is becoming enslaved. The influences which ought to minister to his higher development are working out his degradation. Think of the many men, and women, too, among your own acquaintance who have lived so slavishly close to the soil that "their very souls seem covered with muck." Toilers who tumble from their unrestful beds in feverish haste to take up the burdens of another day, who glance at the beauty of the rising sun, "rejoicing like a strong man to run a race," or at its glory as it drops behind the western slope, only to see if it presages fair weather or foul; restless spirits who find no pleasure in walk-

ing over the green hills without a plow in their hands; to whom it would be a heinous sin to sit quietly down in the dim forest aisles for a hour's calm contemplation.

Such an old farmer I have in mind. Should you drop upon him in garden or potato field, he would hand you a hoe with the grim remark, "One can hoe and talk at the same time." There were no spring seats on his wagon; it was a proof of laziness even to sit on a board. From one task to another he rushed, his elbows bent, his expectant hands ready to grasp the first object he met, his eyes bent on the ground as if gold dollars there might be overlooked. A worthy man, it is true, and one whom the world accounted successful, but as truly a slave as he who pushed the oar in the Roman galley or groaned and sweated in the Carolina rice swamp.

Far up in the north land in the Isle of Rugen there was once a fairy—so the story goes—who, on a summer night's revel lost her tiny crystal shoe. The priceless treasure was picked up by a poor peasant who happened along that way, knowing full well its value, he stipulated as ransom for its return that in every furrow he should turn with his plow he should find a ducat. Sure enough! in the very first furrow he turned out the gold coin, and so in the next and the next. By evening his pockets were full, and he could hardly wait for the night to pass ere he could again to his work. He plowed all day from dawn to dusk. He bought more horses that the plowing might not stop for them to rest. His sons might sow the grain, but he himself must turn the furrows. Of course he thrived. The neighbors said such an industrious man ought to prosper. And so he toiled and hoarded, day in and out, rain or shine, in summer's heat or winter's cold, till he grew wan and pale and at length dropped dead in the furrow. But his children, who never knew the secret of the ducats, laughed at the old man's folly while they squandered the hoarded pile. A fairy story, it is true, but is it pointless or without a moral?

It is a conflict universal, this strife between the human race and the soil. To our primal ancestors came the Creator's command, "Replenish the earth and subdue it," and the endless stretch of the centuries is one successive record of the struggle. Deserts were reclaimed to blossom as the rose, to again relapse to uninhabited wastes. From being a wilderness the country of Palestine emerged into a "land flowing with milk and honey," with vineyards on the terraced hills and golden grainfields in the vales. To-day, with denuded slopes and barren plains, it speaks of the brevity of man's dominion. Ages ago a populous civilization swarmed in the valley of the Euphrates, but for twenty centuries that most fertile region on the face of the globe lies desolate. Forward and backward through the ages has swayed the conflict; in Africa, now sitting in the darkness; in Europe in its noonday of light. The last century has witnessed the most rapid conquest of any period. Australia, South America, the isles of the Pacific are laying their tribute at their masters' feet.

In our own land, eight generations of farmers have won a conquest and made a history unparalleled; and yet, perhaps these millions of acres, reclaimed at such countless cost of individual effort, shall again relapse from their state of subjection into the wild freedom of the wilderness. Should such a fate befall, the historian of the future may seek the causes of the decline. He may find that the lust of conquest gave place to the greed of gain; that the greed of gain, fed by the ducats in the furrows, gained the mastery over every noble impulse until at last spirit and will and ambition and patriotism perished, and with them the crown of dominion over the land. What can prevent such a fate? Education. Raise a revolt against the materialistic tendency of the age. Teach men, and of all men, the farmers, that utility is not the only test of value. There are other possibilities in the soil than pork and potatoes. It is the purpose of education to lift men above the serfdom to corn and hogs, to invest them with other resources, to make them their own masters. I hold to the adequacy of farm life to sustain the best promise of education.

For two generations the cities have been bursting with human strife and struggle, but to-day, although faintly, we hear the cry, "Back to the land." The human tide seems turning again toward the old domain. May it long be the duty and privilege of these institutes to do their humble part in bringing about a higher appreciation of the farmer's calling. Bound to the soil as we are, may our wills and influence be that of masters.

Hercules, when he would win a victory over Antaeus, fought long without success. So long as Antaeus stood erect, with his feet firmly planted on the earth, all assaults were in vain. But at length, learning the secret of his strength, he lifted him from the earth and so gained the mastery. May no Hercules ever discover the secret of our power. May no assaults be successful that would draw us entirely away from the earth and its better influences, or make us slaves by casting us prostrate upon it.

HOW I RENDER AVAILABLE, PRESERVE AND INCREASE THE FERTILITY OF MY FRUIT FARM.

By W. W. FARNSWORTH, Waterville, Ohio.

This is one of the most important topics for the fruit grower, as well as the farmer, to consider.

No matter how thoroughly we spray, how carefully we prune nor how judiciously we have selected our varieties; if there is not an abundance of suitable food in the soil and if both food and soil are not in proper condition the result will certainly be a failure.

I will consider the subject under three subdivisions, drainage, tillage and feeding.

DRAINAGE.

Thorough drainage either natural or artificial is the first and foundation step and is absolutely indispensable to the highest success. If you are certain that your soil is well drained naturally, well and good. If not, be sure and underdrain it thoroughly before you embark in fruit growing.

Soils and conditions vary so that I shall not undertake to say what thorough underdrainage implies, but will say that, if possible, I would have the tile laid three, or three and one-half feet deep. The distance between laterals will vary from two to six rods depending upon the porosity of the soil and also the depth at which the tile is laid.

Underdrainage is far superior to surface drainage in many ways. It prevents, to a great extent, the "washing" of rolling or undulating fields by heavy rainfalls which not only destroys crops growing thereon, and by making gullies very much interferes with the work of cultivation and harvesting, but also works a very great and lasting injury to the field by washing away the most fertile top soil, which has been improved by years of careful tillage and fertilization, and leaving in its stead the raw, crude subsoil. Surface drainage requires open ditches which are a waste of land and a great inconvenience in working the fields. Underdrainage is also preferable by reason of the fact that the rainfall is filtered through the soil and the fertility therein is left in the soil instead of being washed off over its surface and into open ditches.

More important than this however is the action of underdrainage in deepening and aerating the soil. When the surplus water is removed from the soil to a depth,

of say three feet, nature seizes the opportunity and at once begins making that three feet of soil a fit abode and feeding ground for the roots of plants and trees. Removing the surplus of moisture in this manner allows the atmosphere to enter the soil more freely and thus hastens the process of change and decay which is always in operation where heat, air and moisture are present. These processes of nature render available and unlock as it were, the supplies of plant food in the soil. Careful experiments show that eight inches of the surface soil of an acre weigh about thirteen hundred tons and contain three thousand pounds of potential nitrogen, four thousand pounds of phosphoric acid and sixteen thousand pounds of potash. This vast amount of plant food is yielded up slowly, to the demands of the plant, and any means which will furnish a continuous supply of heat, air and moisture will make it more directly available.

The underdrained soil is a warmer soil than one which is not so drained for several reasons. One of these reasons is that where water is allowed to evaporate from the surface of the soil it renders it cooler, as evaporation is well known to be a cooling process. This can easily be illustrated by wrapping a wet cloth around a jug of water and setting it in the wind when it will be made cooler. Cultivation has also been shown to make the soil from two degrees to four degrees warmer than uncultivated soil. A well drained soil affords a more uniform and continuous supply of moisture, which is very important, for as food must be dissolved before it can be taken up by the plants, it matters not if the soil is ever so well filled with food, if there is no moisture to dissolve it, the plant will starve. By deepening the soil we greatly enlarge the feeding ground and also the amount of available plant food in an acre, and we also tempt the roots of the trees to go deeper in the soil where they will not be injured by plow or cultivator and not so easily affected by the extremes of heat and cold or drouth and flood.

TILLAGE.

It has been said that "Tillage is manure" and this is true in the sense that it assists in rendering available the food already in the soil. It does this mainly in two ways. First, by making the soil finer and mellower so as to allow a freer action of the elements upon it; also to allow the roots to penetrate more readily, and feed upon the soil more effectively; second, by conserving moisture. By means of the plow, roller and harrow, and possibly, in some cases, the subsoil plow also, we are enabled to bring our well drained soil into a fine, compact condition, the most favorable for storing moisture and also for feeding out that moisture to the plant at the proper time by means of the well known principles of capillary attraction. The deep, porous soil, like an immense, fine sponge, absorbs the moisture from the rainfall and snowfall, stores it up for a time of need and allows only the surplus to escape. It is estimated that on such a soil fully two-thirds of the total amount of moisture deposited annually, in rain and snow, is retained in the upper five feet of the soil to be drawn upward at the proper time. In order that this soil moisture may rise freely and continuously, the soil must not only be mellow but compact, so that the interstices between the particles of soil may be small enough for the water to rise in them. The oil rises in the lamp wick because the pores of the wick are very fine, but if one end of a tube an inch in diameter were set into the oil it would not rise much. Water will rise in an inch tube, standing perpendicularly in it, about one-twentieth of an inch; in a tube one-hundredth of an inch in diameter it rises five and one half inches, and in a tube one-thousandth of an inch in diameter it will rise fifty four and one-half inches. We see by this the advantage of having the soil so fine and compact that the interstices (tubes) will be very small. Were the ground made in the best possible condition for the upward movement of moisture, and there left undisturbed, much of this moisture would be

carried to the surface of the earth and lost by evaporation, and in addition to the loss of moisture we would also suffer a loss of heat. To prevent this we resort to shallow cultivation which, by breaking up these tubes, a couple of inches from the surface of the earth, checks the moisture there, and allows the roots of the tree or plant to absorb it. We also by this means produce an earth mulch which assists in retaining this moisture.

FEEDING.

The third division may be called feeding the soil and is dependent for its success largely upon the faithful performance of the two preliminary operations of drainage and tillage. I began fruit growing twenty years ago on ten acres of soil which was of only moderate fertility. I realized that there was neither pleasure nor profit in attempting to grow any crop, much less a crop of fruit, upon a poor or a wet soil. I at once underdrained it and began buying and hauling, from the adjacent village, all the stable manure I could secure. I soon discovered, however, that this was a slow and expensive process and also that the supply of manure to be obtained in this way was very limited and insufficient to cover the acreage which I hoped to plant later on. I then began studying up other forms of fertilization. The so called system of "green manuring" was considered. I reasoned at first that to grow a crop from the soil and then plow it back again was no gain, but the stubborn fact remained that a field produced a better crop after a crop of clover had been grown upon it, even if the clover had been removed. It was also demonstrated by experience that growing and plowing under rye, buckwheat and other crops did add to the productiveness of the soil and I began to practice, study and experiment along that line. I soon discovered that these methods benefitted the soil in other ways besides the mere addition of the plant food which chemical analysis showed them to contain. The shading of the soil by means of dense growing crops, or even a brush heap or boards has a tendency to increase the crops grown thereon. More than this, some of the legumes, of which clover, peas, etc., are examples, have the ability to derive nitrogen from the air which is used in building up their tissues, and when the roots and stubble thus built up, decay, the nitrogen is available for the growth of other plants.

I also observed that ground when first cleared and planted was very sure to produce a good crop every season, no matter whether wet or dry, hot or cold. Its superiority over soil which had been longer under cultivation can hardly be accounted for on the ground of greater fertility alone, but is due, to a considerable extent, to its better mechanical condition obtained by the great amount of humus it contains in the form of decayed leaves and rotten wood, the accumulations of centuries. The use of green crops as manure accomplishes the same result. Humus benefits the soil in several ways. It makes it warmer by making it darker in color; a black soil is warmer than a lighter colored one. Those of us who have hoed corn or potatoes, as barefooted boys, on the different soils, remember that on a hot day the sand was so hot on top that it nearly blistered our feet, while the black ground was cool on top. Were we to dig down six inches or a foot, however, we would find a very different state of affairs. The light soil would be cold underneath, the heat of the sun's rays having been reflected, while the black soil having absorbed the heat, would be warmer six inches or a foot below the surface than was the light colored soil.

Humus, which is simply decayed vegetable matter, benefits the soil by the plant food which it contains and also by improving the mechanical condition of the soil, allowing the surplus water to pass through it readily to the drains aiding capillary action and aeration. It also assists in retaining moisture. A soil well supplied with humus will retain about 50 per cent. more moisture than one deficient in humus.

Having thus considered the conditions to be secured and the way in which these conditions benefit the crop, we will now discuss methods of securing these conditions.

I usually aim to apply stable manure upon a clover stubble, thus feeding not only the soil but the clover also and enabling it to accomplish more work for me. Its growth of tops being ranker will shade and enrich the soil more and also extract more nitrogen from the air. The roots will strike deeper and stronger, disintegrating and mellowing the subsoil and in their decay later on will help to fill the same subsoil with humus, thus fitting it for a feeding ground for roots of tree and plant.

After mowing the clover one season, I plow and plant to corn or potatoes and the next year plant to trees, and in my plum, pear and apple orchards I plant raspberries or currants. These are allowed to stand five or six years and if necessary are fertilized once during that time. They are then removed and the ground sown to rye, and clover seed is sown the following February. When the rye begins to head, it is mowed off as high as possible so the stubble may shade the young clover and also support the tops to some extent, and not allow them to settle too heavily on the clover until they are somewhat cured. This clipping process is repeated as often as necessary during the season and all growth allowed to remain where it falls. Of course, if preferred, the rye may be allowed to mature and be harvested, but my idea is that *I can grow fertility cheaper than I can buy it.*

The next year the clover may be made into hay and the following spring the ground should be plowed. By the use of the rye and clover, we have accomplished at least two beneficial results. We have enriched and improved the soil and we have given the orchard a slight check, which will usually start the production of fruit buds and fruit.

Having plowed the clover sod in the spring, we give clean culture until August or September and then sow to crimson clover, buckwheat or rye, to be turned under the following spring.

No one can deny that the common red clover, either the medium or mammoth, stands at the head of fertilizing plants, but its use is not always possible as when an orchard is in full bearing (especially a peach or plum orchard) it would damage it for the time being, to allow clover to occupy the ground two seasons, as it must to attain its full growth.

The advantages of the other crops named over clover are that they can be grown and turned under without interfering with the cultivation of the orchard. They are sown at the last cultivation in fall and plowed under at the first cultivation in spring.

Crimson clover has been condemned by many and its weak point seems to be that it should be sown in July or August and the ground is often too dry at that time to secure its germination and growth. I have had good success with it for four years and believe that if a "good stand" can be secured in the fall, it will usually stand the winter all right and even if it is winter-killed I believe we receive enough value from its fall growth to more than pay all expense. The three years previous to 1896 have been very dry and unfavorable to its growth and many failures were reported, but 1896 was more favorable and results were better. A light sprinkling of buckwheat sown with the seed shades it and assists in retaining snow.

Rye, while not equal to the clovers, is a very convenient crop and prevents damage to the soil by washing or flooding and also stores up the fertility of the soil where it may be preserved for time of need. Many have been disappointed in its use by allowing it to stand until woody and nearly mature before plowing under.

It is estimated that it requires five hundred pounds of water to produce one pound of dry matter in oats, and about the same in rye. This vast amount of

water is pumped up out of the soil and evaporated, and unless rains have been abundant the soil has lost much of its moisture in maturing the rye. If we then plow under this layer of dry woody straw, with a furrow six or eight inches deep on top of it, when the ground is comparatively dry, what little water is left in the soil is arrested in its upward flow at the layer of straw and can go no further, the furrow above it dries out and the crop suffers. To secure best results it must be plowed under early in the season while green and succulent and while the soil is full of moisture.

Buckwheat is said by some to be "hard on the land" and possibly it is if allowed to mature its grain; but when not allowed to ripen it is certainly valuable. It keeps down weeds, renders the soil mellow and may be called a "digerster" or "reducer" of the soil as it is able to assimilate food that is not available to some other plants and stores this food in a form that is available by man, just as the steer feeds and fattens upon grass which is not available to man, and converts that grass into steak which is readily assimilated by the human family.

Under this method of treatment my soil has not only greatly improved in fertility but also in mechanical condition and ability to retain moisture and resist drouth. So marked is this that for the last six or eight years (including three years of severe drouth) I have each year plowed under my strawberry field as soon as through picking and sowed it to the common red clover *without a single failure*.

"Green manuring" alone is not sufficient, however; it furnishes the nitrogen (especially when clover is used) but as "man cannot live by bread alone" so plants and especially trees, cannot live, thrive and yield satisfactory crops by nitrogen alone. This is strikingly illustrated by comparing the orchards on our black swamp soils,—which contain more nitrogen comparatively than potash and phosphoric acid, and which produce a rank, luxuriant growth and but little fruit,—with the older, thinner soils of many of the fruit sections of Ohio, Michigan and New York, where the surplus of nitrogen has been reduced by cropping, and where the fertilizers used in many cases have contained large proportions of potash and phosphoric acid, and where the growth of trees is less luxuriant and more fruit is produced.

We must feed our trees and plants a "balanced ration." No dairyman would feed his milch cows on corn exclusively, neither would the swine grower attempt to fatten his pigs on bran, and we must likewise understand what we wish to produce, and feed our soil accordingly. We must give more study to foundation principles.

It has been shown by careful experiments with a series of plants in pots, that by excessive application of nitrogen alone the growth of the plant could be forced so that no blossom nor fruit would form; while similar plants in similar soil, when supplied with less nitrogen and more potash and phosphoric acid, produced less foliage and more bloom and fruit.

In summing up, then, let me say, that to produce fruit of the best quality and at the least possible expense (two very important essentials at the present time) we must look well to thorough drainage; prompt, thoughtful and judicious tillage, and a proper feeding by means of stable manures and green manures supplemented by potash and phosphoric acid, in the form of wood ashes or muriate of potash and bone or dissolved South Carolina rock, to produce a "complete ration;" for it is only by carefully studying and supplying the needs of our trees and plants that we may hope to attain the desired degree of success.

SOME BUSINESS REQUIREMENTS OF THE FARMER.

By C. M. FREEMAN, Rex, O.

The statistics of 1890, make a good showing for the farmer. The average size of our farms is one hundred and thirty-seven acres. Only one-fourth the total number of our farms is mortgaged. The average mortgage represents one-third the value of the farm upon which it is secured. Four-fifths of the amount of debt on our farms was incurred to buy and improve the property, and the total amount of farm mortgages is hardly one-tenth the value of all our farms. But the farmer, like every other good business man, should improve his business methods. He should love the work. If he is dissatisfied with it and is farming because he has nothing better to do, and intends to move and go into some other business just as soon as he gets a chance, if he is continually in an unsettled state of mind and has no definite plans, he will take no interest in his business; he will not improve his stock, his crop, his home or his society, and will never make a successful farmer. He should be a lover of nature; he should delight in good stock and study to improve it; he should strive for success and put brains in his business. In his home should be found contentment and culture. Society should find in him a friend and helper. Good business sense would suggest that parents should not try to compel a boy, intended by nature for law, medicine or journalism, to become a farmer; we have evidence on all sides of these fatal mistakes. Thoroughness is essential to success. There are too many farmers, who lack this quality in every part of their work. How many fields do we find thoroughly broken? How many fields, when ready to plant, are thoroughly pulverized and leveled? How many hills of corn covered? How many rods of wheat in each drill score well protected from frost. Very few are thorough in feeding stock or selecting breeds.

Good business sense should prevent farmers from attempting more than they are able to perform. But how many farms are run with half the labor, half the teams, half the machinery, half the fertility and half the brains needed to pay anything like a profitable rate on the investment.

Employ competent help. A certain amount of labor must be performed. If it require two men to perform it, it cannot be done by a man and boy without injury to the man, the boy or the crop. It will injure the man if he tries to do two days work in one, the boy if he does a man's work, and the crop if the work be not done. The man who has a good wife is more competent than the one who has an incapable one. A vicious or intemperate man is not competent at all. It is cheaper always to employ efficient help.

A business-like farmer has some knowledge of his soil and crops it accordingly. If he does not know the elements contained in his soil, and does not raise crops best adapted to it, his success will be uncertain.

How many farmers are satisfied, beyond a doubt, about this? How many farmers know what it costs on their land, to produce each crop? How many do we find who adopt a rotation because someone else is successful with it, not thinking of the difference in the land or locality. Positive knowledge is here essential to success.

When I began farming for myself, I was very anxious to succeed. I thought all it needed was the necessary amount of time, but in this I was mistaken, and it took me about four years to find it out. I plowed and sowed and reaped about as my neighbors did, and used the same rotation but was not very successful. In the meantime, I kept asking my neighbors how they were getting along but found they knew but very little about it. No one could tell me his best crop or what it cost to raise it. I resolved to find out what I was doing and I began to use a book and

pencil. I had heard about book farming and was determined to try it. Some of my neighbors could raise eighty to one hundred bushels of corn per acre, while I could not average over sixty bushels and often less. This was embarrassing for two reasons. First, because I did not like to be left behind, and second, because I had spent some time in school and seemingly, could not use my education to advantage in my farming; but at school I had taken a course in bookkeeping and this was what saved me. I opened an account with the farm, and soon learned, from my books, that I did not have corn land but could raise wheat and hay with fair profit. Here are this year's figures:

Cost of timothy hay per ton.....	80 cents.
“ corn per bushel	08 “

Making my half of hay cost me one dollar and sixty cents per ton, and half of corn cost me sixteen cents per bushel, the corn averaging sixty bushels per acre and hay one ton per acre, and netting ten dollars per ton. Any one can readily see where my profit comes in, and yet my landlord insists that I raise the usual acreage of corn that my neighbors raise.

This brings me to an important matter—that of keeping farm accounts. “It is just as essential that a farmer keep a record of his business transactions as it is for the merchant and the banker. It is indispensable to success in farming. Without it the farmer can never see just where he stands, whether he is making or losing money, by this or that course of cultivation. It induces thought and investigation and increases his knowledge of doing business.” It gives him positive knowledge, and gives his opinions more weight than the opinions of those who reach their conclusions by guess work.

Farming, to be profitable at the present time, must be reduced to a system and you cannot rely upon profit in doing this or that simply because your father or grandfather did it to advantage. I showed my expense account for a few years, to an elderly gentleman, when he said, “I, too, kept an account for one year, and when I figured it up, at the end of the year, it was so big it scared me, so I never tried it again.” It may surprise you to know just how much money you spend each year, but knowing will not increase your expenses, on the contrary, it will have a tendency to decrease them.

“Keeping accurate accounts is the best help in getting out of debt during these hard times, of which I know,” was a remark I made to some men who were discussing “how to get out of debt” at a picnic this summer.

I then gave them a little personal experience, which I will give to you.

A few years ago I found myself in debt. In fact, I have but recently become clear of it, having had some bad luck in business, so the question arose, how shall we get out of debt? No man or woman is himself or herself, when in debt, and this was our case. I had worked as hard as I could; more than was for the good of my health and we thought we used every economy possible, in our living. In comparison with some others our living seemed beggarly and the prospects did not seem bright. For the last eighteen years I have kept a memorandum of all my expenses, (and, after we were married, I copied them in a ledger) so to the ledger we appealed. We agreed on what we would like to have the next year, and in this we included a visit that would cost us twenty-five dollars and then every other item of expense that was not positively necessary for our comfort was to be done without.

Now can anyone guess how much we spent each year that was not a positive necessity? It amounted to fifty or sixty dollars per year. We agreed to stick to this plan, which we did, and we succeeded in getting out of debt in two years. What could we have done or rather, how would we have known what to do, if we could not have demonstrated that we could economize still more? Since that time it has been easier to deny ourselves than before.

Keeping farm accounts not only helps us to get out of debt but helps to increase our income by pointing out the leaks on the farm. It is the only way we can definitely ascertain our losses, which, if avoided, would save a great deal of our time and energy.

I shall not attempt to give a plan for keeping farm accounts, but I deem it a part of our business to take an invoice of our assets and liabilities at least once a year. In the column of assets I would include the house, yard, garden, barn and all buildings and all land rated at its actual value as nearly as you can. Then itemize all stock, straw, hay and grain, machinery, etc., and give price of each. Also include all notes due you and cash on hand.

In the column of liabilities I would include all obligations, such as notes, mortgages, trust deeds and accounts. Also rent for house and yards and taxes on farm.

I would keep an account of each crop in the same way. Take wheat for instance. Charge wheat with plowing, preparing land, drilling, seed wheat, cutting, hauling to barn, threshing and hauling to market. Credit wheat with amount sold, amount put in mill for flour and amount kept for seed. In rating team and hand, I think about two dollars per day would be sufficient. Deducting the less from the greater you will know what your profit or loss has been. This is knowledge. Anything else is guess work.

In purchasing machinery and farming implements good business sense is required. Here farmers often pay too much for what they buy and often buy more than they need; they have it in their power to save fully 25 per cent, in their purchases, but first they must learn business methods. That they buy too much machinery can be seen in every community. Take the self-binder for illustration. How many acres of wheat will justify purchasing one?

Let me give you some figures, placing the cost of self-binder at one hundred and twenty dollars and the life of it at eight years:

Interest on \$120 at 6 per cent	\$7 20
Wear and tear per year.....	15 00
Oil per year	1 00
Repairs per year	2 00
Storage per year	4 00
Setting up and tearing down	2 00
Total.....	\$31 20

At present we can hire binders at fifty cents per acre. At these figures a man must have sixty-two acres to cut in order to come out even.

Fifty acres would cost him ..	\$0 62 per acre
Forty " "	77 "
Thirty " "	1 03 "
Twenty " "	1 60 "

Too much machinery and neglect in caring for it causes the greatest losses on the farm.

In the purchase of groceries and provisions more business methods are needed. How many buy coffee by the pound, coal oil by the gallon, sugar by the twenty-five cents worth and matches by the five cent box, or three boxes for a dime, when a dozen boxes cost only fifteen cents. Why not buy sugar and coal oil by the barrel and save yourself some money besides a great deal of valuable time in running after small amounts, as in larger quantities they can be bought cheaper and usually you get a better article.

Another requirement is a market for your produce. To give the farmer a better market, we must have free delivery of rural mail so he can keep in touch with his neighboring towns and cities. How glad would our city cousins be if they could only get our produce fresh and nice. How much better a merchant's business would be if he could sell his customers fresh provisions. At present, unless the farmer peddles his goods, his home market is of little value to him. He finds he has some produce to sell and he takes it to town. He does not know whether the demand has been supplied or not. The merchant has no knowledge of his coming and the day before he has telephoned to the city for apples, cabbage, etc., and when the farmer arrives he is informed that he is too late. He must either take his produce back home or sell it at a sacrifice. In either case the consumer gets old provisions, whereas, if the facilities for communication existed, the merchant could keep the farmer informed as to his needs; the farmer would be glad to keep him supplied with fresh goods and our city cousins would all be delighted to get sweet, fresh provisions. Yes! Let us have free delivery of rural mail.

Last, but not least, your wife is a partner on the farm and should be consulted in all of your business. If she does not use economy and is not diligent, your saving and labor will not avail much. If she does not know the condition of your affairs, she cannot know to what extent to economize nor how much cheer you need for future effort. "Oh, well!" you say, "A woman is all right, but she is not intended for business." If your wife has not intellect enough to understand your business, you made a serious mistake when you had the knot tied; but, if you will ask your neighbors, you will find your wife is the "better business man" of the two, so disabuse your mind as to her lack of business judgment and counsel with her. It will make you money and be time far better spent than that which is now too often spent at the corner grocery.

In all of his work the farmer must mix brains with his business if he succeeds, and throw open the windows of his mind to new ideas and keep, at least, abreast of the times; if possible, ahead of them.

The days when a man could get rich by plodding on without enterprise and without taxing his brains have gone by. Mere economy and industry are not enough, there must be intelligence and original thought and above all adaptiveness and versatility.

"ORGANIC ELEMENTS OF THE SOIL."

By H. M. FOREMAN, Waterford, O.

Agriculture is the oldest occupation of man: gardening is the oldest branch of agriculture, for Adam was created and placed in a garden, and ever since Adam tilled the Garden of Eden, the great question has been, "How to raise profitable crops, and at the same time keep up the fertility of the soil."

The virgin soils are generally rich; but through the agency of man who has continually taken from, and never added to, the soil has become worn and poor. Upon this question rests almost entirely, the success or failure of farming, and yet we are very apt to assign every other reason for our success or failure. To understand this subject we must know something of the nature and composition of plants. For growth every plant needs light, heat, air, water and a fertile soil. The laws governing the sunshine and rain are beyond the control of man; but the fertility of the soil can be controlled to a large extent.

What is plant growth? It is the transformation of inorganic into organic matter. Plants contain at least fourteen elementary substances each of which is essential to their growth. Oxygen, hydrogen, carbon and nitrogen are the organic elements of plants; the other ten are the inorganic elements. To oxygen and hydrogen we need give but little thought, for nature furnishes them in abundance.

To understand these elements more fully, we must know something of chemistry. It is true the chemist may know practically nothing about farming and yet the successful farmer must depend largely upon him. It is a self-evident truth that all matter is indestructible. Take for instance a block of ice, and melt it, it becomes liquid and occupies a little less space, boil it, and it passes off into vapor or steam and occupies a space one thousand, seven hundred times as great, yet it is the same, only in a different form; but we must not conclude there are no chemical changes for the number is legion.

Carbon, although but little talked about, deserves to be mentioned first, for it forms nearly one half, by weight, of all our farm products. Pure carbon, is a solid substance destitute of taste or odor, and is not soluble. It occurs, in a pure form in the diamond and nearly so in graphite, and enters very largely into animal and vegetable tissues. When carbon is burned in oxygen it forms carbonic acid. Now while, all over our land, stoves, furnaces, and all conceivable heating apparatus, and every pair of living lungs, also the decaying of animal and vegetable matter, are sending forth a stream of this carbonic acid the air would become so charged with it that no life could exist, did not nature provide for the emergency.

Plants and trees must have carbon the leaves and stems of plants are full of pores and, through these, carbonic acid is absorbed, after which it undergoes a chemical change and forms sugar, starch, fiber, etc., but in these changes the carbon only is retained, the oxygen is again forced into the air. While plants absorb carbon in this way, they also absorb large quantities through their roots, receiving it largely by the decaying of organic substances.

New soils generally have an abundance of carbonaceous matter (generally known as humus) because they are composed largely of decayed vegetable matter, which has been accumulating for years or even ages. But man by constant cropping without any application of bulky manure uses up the humus and the soil becomes exhausted; the process of decay stops, because there is nothing to decay; the production of carbonic acid ceases; the conversion of nitrogenous matter into ammonia and nitric acid comes to an end; the water in the soil loses part of its solvent power; the soil hardens, closes its pores, and is practically dead. Nature knows but one remedy, "rest" and after the lapse of time a new soil is formed and man, if living, may commence again.

Man has discovered the so called complete manures; these supply all the needed food for plants except carbon, and if, by the use of these, good crops are raised, the air has to furnish the carbon or we must draw that much larger on the supply of humus in the soil. Real life can only be given back to the soil by feeding humus. Then the question arises, How shall we feed our soil this humus? First, by using all the manure that the farm will produce. This not only furnishes a large amount of bulky substance thereby furnishing humus and improving the mechanical condition of the soil, but it also furnishes a large amount of the other elements of plant growth. After exhausting this source, we may resort to green manuring, which aside from other effects, furnishes a large amount of humus. For this, rye may be used. We have been told that rye does not add a single pound of fertility to the soil except what it took from it. That may be true, but it adds a large amount of humus in the most available form for future use. There should be nothing burned upon the farm which can be plowed under without interfering with the cultivation, or filling the soil with noxious seeds. Nitrogen is a very important element, because: First, without nitrogen no animal or plant life can

exist; second, it is not available in its pure form; third, it is the most costly element to purchase; fourth, it is the hardest to hold when once obtained. Nitrogen in its free or gaseous state constitutes about one fifth of the atmosphere and enters into both animal and plant life, the amount differing in different plants, and in the same plant in its different stages of growth. The leguminous plants are especially rich in nitrogen. The nitrogen of the soil is derived from the residue of former animal and vegetable life, by fixation of free nitrogen, by organisms of the soil, and by nitrogenous compounds, washed down by rain and snow and absorbed by the soil. It exists in three forms, ammonia, nitrates and nitrogenous compound matter. The great bulk of nitrogen is in combination with organic matter. The amount of nitrogen carried down into the soil by rain and snow is only about three and one half pounds per acre each year. Hence if the ammonia and nitric acid of the air is to be of any great importance to agriculture they must be taken up by the crop or soil to an extent far greater than that which takes place through rain and snow. Recent investigations have shown that the fixation, transformation and in some plants the assimilation of nitrogen is promoted or controlled by vital activity of microscopic organisms in the soil. Certain organisms infesting the roots of leguminous plants, have the power of rendering the nitrogen of the air available to the plants. To obtain nitrogen in this way we believe there is no better plant than clover, which assimilates the nitrogen of the air by means of micro-organisms or nodules found upon its roots. While there are other plants that have this power, clover has many advantages over other plants. The roots of clover reach to greater depths than most other plants, therefore bringing up elements that few other plants would reach. The roots act to a certain extent as drainage, and in decaying leave a place for the air to permeate the soil, thereby feeding carbonic acid directly to the soil. We may harvest a large crop of first class hay, containing on an average forty-five pounds of nitrogen to the ton. And this if carefully fed and the manure saved may practically be returned to the soil. We may then gather a crop of seed, and still have a large amount of roots and stubble left to increase the fertility of our soil, not only by the amount of nitrogen gained, but by the amount of humus. Farmers are paying out each year many hard earned dollars for commercial fertilizer and often with little benefit. A large portion of this is for nitrogen generally in the former of ammonia. Let us investigate this side of the problem, and see what we are buying.

The niter beds of Peru, Chili and other countries are the result of the activity of micro-organisms, three distinct classes probably taking part in the formation of nitrates. The first converts the organic matter into ammonia, the second the ammonia into nitrites and the third the nitrites into nitrates. Plants take up nitrogen, almost exclusively in the form of nitrates. Hence nitrates are at once available to plants while all other forms have to undergo the process mentioned. Nitrates are high priced, and are readily soluble. We believe the farmer, unless he is a specialist, will not be justified in purchasing nitrogen in the form of nitrates. Nitrate of soda is the best form of nitrate and should contain 16 per cent. of nitrogen.

Sulphate of ammonia is a by-product of the gas works and contains 25 per cent. of ammonia. Ammonia consists of three parts of hydrogen to fourteen parts of nitrogen. For example, if in buying commercial fertilizers the analysis reads "four per cent. ammonia" there is only about three and one fourth per cent. nitrogen. This is not so soluble as the nitrates, yet sufficiently so to be applicable to nearly all plants. Yet it is so high priced that but little is used in commercial fertilizers. Dried blood contains about 11 per cent. of nitrogen and is a valuable fertilizer. Tankage is the cheapest form of nitrogen and consequently is extensively used. It is the residue of rendering vats, dried and ground. While this is the cheapest in price it is sufficiently available for the average crop. Horn and hoof meal and ground leather should be considered as adulterants, and we have reason to believe that they are

used to some extent. But why pay out so much money for nitrogen when we can furnish a large portion, at least, by raising clover or some of the other leguminous plants.

THE CONDITIONS OF PLANT GROWTH.

By S. H. HURST, Chillicothe, O.

Scientific farming is not a mere visionary or theoretical method of farming, unsupported by experience and unrewarded by results. It is simply *intelligent* farming, based upon experience and observation, and enlightened by the truths of agricultural chemistry, of botany, and in fact by all the known truths of physical science which operate in the vegetable kingdom.

In so far as a man can become acquainted with these known truths, and determined laws of nature, and adapt his labor to the conditions that govern the growth of crops, his work on the farm will be more intelligent, and with this intelligent interest and pleasure in his labor, his ambition will be stirred and his work will be better done.

In studying the laws of plant growth, the conditions that control and the factors that enter into that growth, a wide field opens before the student farmer. He will soon learn that air, soil, water, light, heat, fertility and cultivation are elements or factors entering into, and modifying the growth and fruitage of all vegetation. His first inquiry will naturally be for a seed bed; a farm or field or plat of ground adapted to the growth of the particular crops he wants to produce. He must, therefore, first study the soil. He will naturally find that soil is simply an earth-bed in which, or out of which, the plant grows, and brings its fruit or seed to perfection. He will learn that the soil performs two offices, in the growth of vegetation. First, forming a foundation and a mechanical support to the structure of the plant, enabling the roots to take strong hold upon the earth, and maintain its upright position of stem or stock; and second, to hold in available solution all those elements of fertility which the plant needs, and must find in the water of the soil, and draw through its rootlets and roots, in order to grow and mature. He will find that soil is a great mixture or compound formed of many substances, and differing widely in different localities. Referring to their composition, soils are classified as sandy, loamy, clayey or peaty, according to the predominance of sand, clay, vegetable mould, or a happy mixture of clay and sand which retains moisture, and forms a mellow loam. Each of these widely different varieties of soil is especially adapted to the growth of certain classes of plants, grasses, grains, vegetables or fruits, and as certainly unadapted to the growth and perfection of other classes of farm and garden products, and it will be a most important study to the inquiring farmer, to adapt his crops to the special varieties of soil that may be found upon his farm.

Next to the soil itself, are its conditions as to fertility, water-supply and mellowness or refinement. No plant can grow in a sterile soil. The thirteen elements of matter, which in their compounded forms enter into, and are essential to the organism of plants, must be held in solution in the waters of the soil, and in something near the proportion demanded by the plant. Most of these elements of fertility already exist in the soil in sufficient quantity, but others, especially nitrogen, potash and phosphorus, that are so essential to plant life, must be constantly supplied, to replenish the soil, which is so rapidly exhausted of these essential elements, by grass feeding crops. These three forms of compounded plant food, nitrogenous, phosphatic and potash fertilizers, *must* be supplied by the intelligent

farmer as they are demanded by the soil, if remunerative crops are grown. Every year we see men planting to corn or seeding to wheat, soil that could not, under any circumstances of weather or season, produce half a crop. In the worn soils of the Carolinas large areas are planted to corn every year with the understood certainty that from ten to twenty bushels of corn, per acre, is all that such soils can possibly produce. And yet it is equally certain that properly supplied with the needed fertility this same soil would produce three times that amount per acre, and with less labor in cultivation.

The intelligent farmer studies the conditions necessary to plant growth, studies and experiments to find out what kind of fertilizer his soil needs, and, if possible, to supply that need; and if he cannot supply the particular wants of his soil, he directs his labors into other channels and refuses to plant where he may not reap. The presence of sufficient water in the soil is also a most important factor of plant life. Plants naturally absorb large quantities of water from the soil, appropriating what they need in their own structure, and giving off the surplus to the atmosphere through their leaves in the form of vapor, depositing, meanwhile, in the upward flow of sap, those elements of fertility which the plant must draw from the soil to build its framework—its roots and stocks and branches, its twigs, leaves, buds, flowers, fruit and seed. Some vegetables, such as melons, celery, cabbage, onions, etc., are largely composed of water and need a soil almost constantly supplied with water, while other products need a drier bed in which to grow. The water supply of soils is not wholly under the control of the farmer, however. Too much or too little rainfall may injure or ruin his crops for the season, and no knowledge or skill on his part can wholly avert the disaster. Nevertheless, by surface or by tile draining, or by surface or sub-irrigation much may be done in intensive farming, or gardening, to maintain that happy medium of water supply, which puts the soil in the best possible condition to feed the plants. Soils that are naturally wet, especially those having a hardpan clay sub-soil, must of necessity be tiled to a proper depth, before they are available for grain or garden crops. Much attention is now being given to sub-irrigation by a system of tiling on level areas through which water is supplied to the soil rather than drained from it. Thus, for such crops as celery, onions, etc., the water is made to stand on a level at any depth desired below the surface, so that with a fairly dry surface for cultivation, the roots of the plants may penetrate the wet soil below, and drink their fill of the liquid nourishment.

Next to fertility and water in the soil, mellowness or refinement is a factor in the growth of crops, and this condition of the soil is almost wholly under the control of the farmer. Barnyard manure or decomposed vegetable matter of any kind is promotive of mellowness and a degree of moisture is necessary for the most inviting plant bed. But refinement by cultivation is generally an absolute necessity; years ago it was common to see corn planted or wheat sown in cloddy ground where half crop seed need an impossibility. But improved methods have brought the clod-crusher, the smoothing-harrow, the disc-harrow and the drag into general use, and now no intelligent farmer thinks of planting or drilling for any crop until his soil is in good condition. A good seed-bed is the first consideration. We refine and mellow the ground before planting to prepare a mellow *seed bed*, and we cultivate and refine the soil as the plant develops to maintain a mellow *root-bed*. In the work of cultivation it is an error to say or to suppose that we cultivate the *crops*. We do not, primarily. We cultivate the *soil* to make it mellow and fine, so that it will hold the fertilized moisture, and thus invite and promote root growth and root feeding. We certainly do not want to cultivate a plant simply to lacerate or destroy or shorten in its roots, thus depriving it of the power to feed on the vegetable nutrition or fertility around it, and with our modern ideas of level culture we do not plow to "fill-up" the plants. The two legitimate offices of cultivation in crop grow-

ing, are the refinement and mellowing of the soil, and the destruction of the weeds. After corn or potatoes are planted, it can scarcely be desirable to plow at all to any depth, if the soil between the two rows is quite mellow, so that the roots and rootlets can push out in every direction, and drink in the fertile water. But if after planting the ground is "packed" by heavy rains it will doubtless be well to plow once with a set of long narrow shovels to mellow up the land again, lest in its compacted condition, dried and "baked," as we say, it would be almost impervious to root growth. But if the middle is continuously mellow, then only the surface should be stirred to a depth of one to two inches, and this by a fine short-toothed harrow, or by a sharp fluke harrow, or by a system of sharp steel knives which, attached to a harrow frame, cut off every starting weed just below the surface of the ground. This shallow cultivation of the ground destroys all the weeds and makes a sort of mellow mulch which lies like a blanket on top of the ground, breaking up the capillary power of the soil, and holding the moisture that is stored in the root-bed beneath this blanket so that it may constantly feed the growing plants. This new theory and practice of surface cultivation *must* commend itself to the practical farmer, since it checks evaporation, catches the rainfall and transmits it to the subsoil and destroys the weeds just as they germinate, thus leaving the whole wealth of fertility in the soil, and leaving also the entire equipment of plant roots unbroken, that they may feed upon this fertility and bring the crop to its fullest and largest perfection.

We have now considered the soil, the water held in solution in the soil, the fertility held in solution in the water of the soil and the shallow cultivation of the soil to promote and retain this fertilized moisture within the reach of the roots and rootlets of our crops. The factors and conditions thus far noted cover all the sources and resources of plant life that are drawn from the soil. Beyond these, heat and light are intangible factors of plant growth over which the farmer has little or no control. The atmospheric elements which contribute to the growth of plants are also of far more significance than is generally supposed even by practical farmers. Doubtless it is the general opinion of men that plants or crops get most—indeed nearly all—their substance from the soil and but little from any other source. But, strange as it may seem, scientific investigation has proven that nine-tenths of the substance of plants comes from the air and less than one-tenth from the soil. The theory of agricultural chemistry (doubtless practically true) is that the ashes of plants contain simply the elements derived from the soil, while those derived from the atmosphere are given back to the air again in the process of combustion. Now if you were to burn a shock of thoroughly dry corn and fodder, weighing two hundred pounds, you would not get twenty pounds of ashes, or one-tenth of the whole. All but the ash or earthy elements are driven off in the process of burning and become a portion of the atmosphere again. Now, as in the matter of light and heat and rainfall, the farmer can have little or no influence whatever in changing or controlling the atmospheric influences or elements that affect vegetation. His work is concerned wholly in securing for his crops that one-tenth of their substance which comes from the soil, but that one-tenth is wonderfully important. It furnishes the framework of the stalk of the plant; it furnishes the silicon which strengthens that framework and enables it to stand under its load of grain or fruit, in storm as well as in calm; it furnishes the iron that gives to the plant its leaf-green and thus through the green leaves enables it to take in the nourishment which the air supplies, so that the elements of plant life under the control of the farmer are the essential and indispensable elements without which the plant could not live, much less bear perfect grain or fruit. Into his fields then the student farmer should go, as a child goes to school—as a student of chemistry goes to his laboratory—to study the composition, character and needs of his soil, and if possible to master and understand in theory and practice those conditions under which plant growth is

most successfully promoted and the best crops assured. It is his work to fertilize his soil, to mellow and refine it, and, in so far as he can, to promote the retention of moisture and the continuance of mellowness through all the period of crop growing, and by surface culture to absolutely destroy all weeds, and give the entire strength of his soil to the growth of his crops—it is by the positive knowledge and mastery of all these factors and conditions that he shall be ultimately repaid for his intelligent and tireless labor.

“KING CORN.”

By GEO. E. LAWRENCE, Marion, O.

Of all the rich and varied products of the soil which America has given to the world, “Indian corn” or maize stands preeminently at the head both in value and importance to mankind as well as to the brute creation.

The first authentic account we have of corn is at the time of the discovery of America by Columbus, when it was found under cultivation by the Indians (hence the name) and specimens of it were exhibited by the discoverers, upon their return to Europe, as one of the curiosities and wonders of the New World, little dreaming no doubt of the importance of their discovery, or the value to mankind it would in the future prove to be.

Indian corn is divided into four distinct varieties, to-wit: dent, flint, sweet and pop corn and of these the dent is by far the most important. These are each subdivided into classes. For instance, the dent embraces two classes, namely, yellow and white, and each class may be further subdivided into types, as large, medium and small; and these in turn can be separated into an almost innumerable number of varieties distinguished by points of difference of which the following are, perhaps, the most important:

First—Color.

Second—Time of maturity.

Third—Shape and size of ear.

Fourth—Shape and size of grain.

Fifth—Number of rows.

Sixth—Hardness and chemical composition of grain.

Seventh—Size and color of cob.

Eighth—Length and thickness of husk.

Ninth—Number of ears on stalk.

Tenth—Size of stalk.

The *culture of corn*, of which I will speak briefly, naturally includes securing seed, preparation of soil, planting and cultivation. Good seed is necessary in the raising of any crop, and to none is it more so than corn, as most of us have no doubt learned to our cost. The earliest and best specimens of the varieties we deem best suited to our soil, climate and use should be selected in the fall, either before cutting or at early husking time and be thoroughly dried before the first hard freeze and then kept secure and dry.

In the preparation of the soil the ground may be plowed in the fall on most soils, and with profit on some, as on sod ground badly infested with worms, but in our locality spring plowing is generally practiced. It should be done, however, as soon as the ground is in good condition, *then thoroughly harrowed*, when, if it has been properly drained and clovered or manured, it will form a seed bed ready for planting.

For the farmer in general I would recommend that it be planted in rows, hills three feet, six inches apart each way, with four grains to the hill. In about three days after planting the ground should be harrowed and, in dry weather, rolled. As soon as the corn is large enough to be seen in the row, the cultivator should be started and work so arranged that the corn may be cultivated once a week until large enough to "lay by," which will be when too large to use a two-horse cultivator. In other words, early and constant tillage, shallow and level cultivation should be our practice as well as theory.

The old method of "hilling up corn" and plowing it after it shoots and tassels is now almost entirely discarded, as it should be.

The importance of the corn crop will be apparent upon inspection of the Annual Reports of State and National Departments of Agriculture. Bear with me for a few moments while I give a few figures, and statements, which will aid us in forming some idea of the magnitude of this crop. The average yield for Ohio during the five years ending with 1894 was, in round numbers, about eighty-one million bushels, with an acreage of about three million acres, showing the average yield to be about twenty-seven bushels per acre, and the average price was forty-two and two-fifths cents per bushel. Let us now glance hastily at the product of the country at large. The average crop for the decade 1880 to 1889 inclusive, for the United States, was estimated to be one billion, seven hundred and three million, four hundred and forty-three thousand and fifty-four bushels; the average acreage was estimated at seventy million five hundred and forty-three thousand four hundred and fifty-seven acres; the average yield per acre was twenty-four and one-tenth bushels; the average price was thirty-nine and three-tenths cents per bushel and the average yearly value of the crop was six hundred and sixty-eight million nine hundred and forty-two thousand, three hundred and seventy dollars. We also find that the average price for the five years, 1890 to 1894, was forty-two and one-half cents per bushel.

But let us now for a moment consider the immense crop of 1895, which is the largest crop ever grown, according to the reports at hand. We find that it is reported as aggregating the immense sum of two billion, four hundred million, seven hundred and eighteen thousand bushels grown upon eighty million eight hundred and fifty thousand acres, and averaging twenty-nine and six-tenths bushels per acre.

In order to grow this great crop, it would require over four million of men to plant and "tend it," each cultivating twenty acres, eight million of horses would also be needed, besides the vast array of plows, harrows, planters and cultivators necessary to complete the work.

If this enormous quantity of corn were put into bushel baskets, in line, side by side, it would make a line eight hundred and seventy-two thousand, seven hundred and twenty-six miles in length, which would be enough to belt the globe, at the equator thirty-five times; it would cover a township of thirty-six square miles, more than seven feet deep; it would fill a crib one mile long by one mile wide and two hundred and sixty-four feet in height, and it would bury a quarter section of land to the depth of ten hundred and fifty-six feet, and finally at forty cents per bushel it is worth nine hundred and sixty million dollars.

A few years ago it was the favorite claim of many that "*Cotton was King.*" If that claim was ever true in the past, it certainly is not true at the present time. If cotton ever was king, his glory has departed, his scepter is broken, and his kingdom wrested from him by his new rival, this mighty young giant of the West, this child of the new world, "*King Corn.*"

If we are to have royalty in this land of ours, let us consider some of the characteristics, and claims, of this heir to royalty, this claimant to our support. He is by birth and breeding, every inch American, which more than fills the constitutional requirements of our chief ruler. In his infancy he is vigilantly watched and

guarded by sturdy hands, from the many enemies who, nihilist-like, would seek to destroy him. In his youth his growth is fostered and nourished by vigilant culture, and by the richest viands suitable to his kingly nature. No frothy beer is ever seen in his cup to debase and degrade him, and even wine is unknown to him, but instead the rain from heaven is his beverage, and the sparkling dew-drop is the nectar he nightly sips. As he approaches manhood his strength and stature increase with marvelous rapidity, his vesture takes on a richer hue, soon his couch is of silk, then his regal pennants are flung to the breeze, nodding plumes of purple, green and gold appear in all their stateliness and splendor, and he is crowned king of the field. His coffers exceed in richness those of old Cræsus in his palmiest days, and unlike many rulers, the more faithful the attendance the richer the pay. His supporters and attendants are more in number than the fabulous hosts of Xerxes, the victorious legions of a Cæsar, or even our own "boys in blue." His dependents exceed the swarming millions of China. His trusty blades, which gleam and rustle on every hillside and plain, by every streamlet and river all over this broad land, outnumber the combined weapons of war, of all ages.

These "tented fields," pitched on all this wide domain, announce his princely sway; they herald not the clash of arms, and flying squadrons, but well filled sties, quiet flocks, and lowing herds; not the bugle call, but the dinner bell; not the bursting of shell, but overflowing corncribs. They speak not of ruined homes, blasted hopes, anguish, misery and death; but of happy families, cheerful fire-sides, peace, plenty and prosperity.

Fellow citizens, what think ye of our sovereign? Are not his claims well founded, and his title good? Surely the proofs cannot be disputed. Then it becomes us as loyal subjects, to heed well the laws which govern the realm, study well the needs, requirements and necessities of our king, guard well the gates of the palace that no enemy gain admittance, and we will be amply rewarded, and long will be the reign, prosperous the people, and free the subjects of good "*King Corn*," *Long may he wave!*

THE GRAPE.

By THEO. F. LONGENECKER, Dayton, Ohio.

Although much has been said and written about the grape yet it is not as fully understood as should be a fruit whose requirements are so simple and easily mastered as are those of the grape.

Keep the feet dry is a hygienic law that applies to fruits as well as to people. In other words plant your grapes in a location that is well drained either naturally or artificially and that has exposure to the sun.

Select thrifty, one-year-old vines; if the roots are very long, cut them back to about one foot in length. Make the hole that is to receive the young vine sufficiently large to allow spreading the roots when planting; plant the vine deep enough for the earth to cover the original cutting. After planting, cut off all the top of the vine excepting two good buds just above the surface of the ground. When these begin their growth watch them and with the hand rub off the shoot that is making the least desirable growth; this forces all the strength of the plant into one shoot. Keep all suckers off this single shoot for at least one foot from the ground. The second spring cut this back to two buds as before. Let two shoots grow the second year and keep all suckers off for at least two feet as was done the year previous. The third season cut these two feet long, so they can be tied to the

first wire of the trellis, which should be about two feet above the ground. On each of these canes let two shoots grow. Keep all suckers from two feet of the new shoots; suckers on growing shoots when only a few inches long should be rubbed off with the hand.

After the young shoot has attained a length of five or six joints it is not so necessary to keep off the suckers for according to the strength of the vine it will make wood whether this be in the development of a few shoots or many. What we want is that the wood near the main vines be strong and healthy and have well developed buds for next year's fruit. All beyond that is cut away at pruning time.

When the vine has attained sufficient size to bear a partial crop of fruit, which may be three or four years after planting, we will trim to about four spurs, each spur having three buds. This will give us probably twenty bunches of fruit. If every bud yielded to the limit, the vine might give us thirty-six bunches, which would be entirely too many for a vine of this age unless it were unusually strong. When a vine is fully developed it should be allowed to bear about sixty bunches of fruit.

Now for the principle of pruning. Grasp this and thereafter all is easy. Well developed buds average about three bunches of fruit to the bud. A spur is some of last year's growth of wood left on the vine when pruning. The best fruiting buds are usually the first three or four buds on a cane of last year's growth, not counting the bud in the axil; then let us leave three buds on a spur. Three buds on a spur and three bunches to a bud gives us nine bunches to a spur. If we make no allowance for imperfect buds, about seven spurs to a vine, would be enough. Let us make a liberal allowance for imperfect buds and leave, say ten spurs of three buds each to a vine; these spurs should be distributed to different parts of the vine. If we see the plant is setting too much fruit, some of the weaker shoots with their bunches of fruit can be rubbed off. In the latter part of May in this latitude the vines should be gone over and all weak suckers and shoots be rubbed off in the central part of the vine. This should be done at the same time that we thin the fruit. Let no shoots grow except those fruiting, or those wanted for fruiting wood another year.

In pruning, leave thrifty spurs near the main vines and not to exceed five feet away from the roots. Always prune so as get a renewal of wood within a few feet of the ground. By this method a vine may be retained in fruiting for twenty-five or more years and yet have very little old wood above ground.

Near where I live is a vineyard of several hundred vines, thirty-eight years old, pruned according to this plan, yet on examination very few persons would suspect them to be more than one third that age.

In speaking of table grapes I shall name only those that I find the most reliable out of some sixty varieties that I have tested. In each color the varieties will be named in the order of their ripening.

Black—Worden, Concord, and for culinary purposes, the Clinton.

White—Niagara, Colerain, Pocklington.

Red—Brighton, Woodruff's Red, Catawba.

There is a number of other varieties that have desirable qualities, and a fancier of the grape would want to add some of them to the list here given. This article is written for those whose knowledge of the grape is limited and it is best to confine the list to a few of the standard varieties. So few farmers know the Worden that it is better to call special attention to that desirable, old variety.

The Worden is a hardy, reliable, productive, early black grape of excellent quality, superior to the Concord, and probably the most profitable early table grape now grown for the markets. The objections to it are, ripening irregularly and a tendency to bursting of the berries on account of their tender skin.

The Campbell's Early is an early black grape, large clusters, berry about the same size as large Concord. The berry clings well to the bunch; skin tough, does not burst; pulp tender, separating readily from the seeds; few seeds. Flavor among the very best, far superior to Concord and without the acid center that many object to in the Concord and Catawba. If this variety proves hardy and productive, as we now have reason to believe, it will occupy an important position among our early table grapes.

If you have varieties that are not desirable, get some one, experienced in grafting grapes, to cut them off about six inches below the surface of the ground and graft them with other varieties. After the graft has been inserted fill up the hole, packing the earth very firmly around the graft. Mound the earth several inches where the old vine stood. In order to follow the plan here given for grafting the scion should be at least one foot long so that it will project above the little mound around it. The only method by which grapes can be grafted successfully is to have the union of scion and stalk under ground.

Both the foliage and the fruit of the grape are subject to the attacks of fungi, so something should be said about fungicides. In the spring, before the buds open, thoroughly spray the vines and trellises with a strong solution of Bordeaux mixture, made as follows: Six pounds of fresh quick lime and seven pounds of sulphate of copper, which makes fifty gallons of the mixture. Later sprayings, just before the bloom opens and just after the vines are through blooming, should be only one half the strength of that just given. For years I have used one sixth to one tenth more lime than sulphate of copper in preparing the Bordeaux mixture. Made in this way the excess of lime prevents the sulphate of copper from injuring even the most tender foliage of any class of fruits and it can then be used of sufficient strength to destroy the fungi. For several years those advocating the use of the Bordeaux mixture advised the use of equal amounts of lime and sulphate of copper. Others relied on the ferrocyanic test, but occasional injury to the foliage of some fruits resulted. Where a little excess of lime has been used no injury has followed and as lime is also, to a certain extent, a destroyer of fungi, we can use it freely. Even so high an authority as Prof. A. D. Selby, botanist of the Ohio Experiment Station, now advocates the use of a little more lime than sulphate of copper in the Bordeaux mixture.

By a judicious use of this mixture we not only prevent the fungous growths from attacking our grapes this season, but we keep the foliage in such healthy condition that it insures the ripening of the wood and a corresponding development of healthy fruit buds for the succeeding season. Keeping the foliage healthy late into the season will cause even the Catawba to ripen its fruit here, although many regard it as too late for this latitude. The trouble is not in its being too late to ripen here but in the imperfect condition of its foliage.

Many fungicides have been put upon the market but none have proven as effective as the well known Bordeaux mixture.

THE CARE OF FARM IMPLEMENTS.

By C. D. LYON, Higginsport, Ohio.

I was asked to prepare this paper by a manufacturer of farm implements who justly claims that more implements are ruined by want of oil, by exposure, and by lack of care than by actual use.

There are three things necessary to the long life of a machine; first shelter, second oil, third paint; if you use plenty of shelter you can get along with less

paint, and if you keep your implements well painted a little exposure to the weather will not damage them, but remember that the one thing you can never do without is OIL. I always keep on hand a gallon of harvester oil; there are a half dozen good brands. As it only costs at retail about forty cents per gallon, and by the barrel about twenty-two cents, this is the oil for general use.

For fast running journals that sometimes heat from friction, I keep a can of winter lard oil with a heaping tablespoonful of finely pulverized black lead added; if you cannot get black lead, have the druggist pulverize a bar of Rising Sun stove polish and use this. No bearing can heat if kept oiled with this lead and oil.

Don't smear cog wheels with oil or grease, as the oil gathers sand and dust and soon cuts the cogs to a feather point, makes them jump out of "mesh" and a broken machine is the result.

Never run a belt, chain or binder canvas any tighter than is necessary to make it do its work, as undue tightness strains not only the chain or belt but the entire machine. I knew a man to wear out a binder canvas in one year, because he drew it tight "so as to hear it hum," I heard him "hum" when he paid eight dollars and fifty cents for a new canvas. Let canvas straps out one hole for the mornings when the straw is damp; do this when you unhitch at night. Straw, damp with dew, contracts the canvas enough to tear off straps, and it is easier to loosen and tighten up again when the straw gets dry, than to go to town and have new straps put on.

Have a tarpaulin cover for your machine and put it on at noon to protect from the sun as well as from sudden harvest showers.

About every machine will be found a nut or two that will not stay on. Wet a woolen string in strong brine and tie it around the projecting end of the bolt, this will make a rust joint that will stay tight forever.

Keep mowing machine knives sharp and see that the split ends of spring keys are kept well spread.

Paint your wagons, plows and harrows at least once in three years; do the work yourself and mix your own paint. Grind your color with just enough linseed oil to make it of the consistency of thin putty, add half as much turpentine as you have of this mixture, put in a tablespoonful of Japan dryer to each pint and thin with linseed oil until your paint will spread well. Sandpaper off all loose paint, dirt and grease, and repaint with a good brush.

I don't like red paint, as this color is very trying to the eyes in bright sunshine. For plows, harrows, etc., I would use green, blue or yellow. The binder is hard to paint, so house it well and it will not need it very often. The cost of painting a wagon is one dollar and twenty-five cents, a plow twenty-five cents, a harrow forty cents, a sled fifty cents.

Keep your brushes in water through the night and when done painting wash them out in benzine or gasoline and dry them well. Benzine costs twelve cents a gallon and good brushes forty or fifty cents each; a gallon of benzine will clean two dozen brushes.

When the binder is put away in the fall oil every bearing just as if you were going to work, and repeat this oiling about midwinter. Hang the canvas with a wire to a beam away from mice and *order all needed repairs when you put the machine away*. Soak a rag in machine oil and tie it over the knotted to prevent rust.

A day or two before you want to use the binder take a can of coal oil and put a liberal quantity in every cup or oil hole, and oil the knife from end to end. This is to cut off gum, and you will be surprised to see how much easier it will make the machine start up.

Linseed oil and whiting on the bright metal of plows, cultivators or disc harrows will prevent rust, and will scour off in a few minutes work in the soil.

Again I will say that oil and paint cost less than wood and cast iron, and all

implements that are ever exposed to sun and wet should be kept painted; this applies especially to plows, harrows, cultivators, sleds and wagons, and if you will go to work and paint up your farm tools, they will not only last longer but will look so nice as to make you have a kindly feeling for that institute man who told you "How to care for farm implements."

CORN.

By J. L. ROUDEBUSH, Stonelick, O.

Among the grains cultivated in the United States, maize or Indian corn takes precedence, as it is best adapted to the soil and climate, and furnishes the largest amount of nutritive food.

It is an indigenous product of the New World; growing between parallels of forty-four degrees north and south, though the corn belt proper is found between the thirty-eighth and forty-third parallels north or south. It has been found growing in a wild state from the base of the Rocky Mountains to the humid forests of Paraguay; where each grain instead of being naked, as is the case with the four hundred and more cultivated varieties, is completely covered with glumes or husks. Corn was held in high esteem by the aborigines of both North and South America and entered into the ceremonies and mythology of many of the Indian tribes. The six nations had their "Harvest Moon" or "Feast of the Roasting Ears," and Vega, one of the earliest Peruvian historians, tells us that it was exclusively used in the ornamentation of the palace garden of the Incas.

In this garden the stalk, leaves, tassel and husk were of solid silver, while the ear was of gold. The allegory of its origin as told Schoolcraft by the Mandans is similar in many respects to Jacob's dream. At the time of the first permanent settlement by the whites, it was cultivated by the many tribes from Maine to Florida as an article of food, as attested by the large number of stone pestles and mortars found from Massachusetts to California and from Wisconsin to the Gulf. In 1608 the Virginia settlers at Jamestown first cultivated it under the instruction of the Indians. Forty acres were planted that year which made an enormous crop. Samoset and Squanto, in 1621, taught the Pilgrim Fathers how to cultivate it and more particularly how to manure it with alewives. That season they planted twenty acres to corn and six to barley and peas. The corn yielded largely while the barley and peas were a total failure. The permanency of these first two settlements was in a great measure due to the corn given them by the Indians the first year and that raised by the settlers subsequently.

Seven-eighths of all the corn produced in the world comes from the United States; Turkey, Hungary and Russia in Europe, and Argentine in South America, producing the other eighth. In 1800 the crop was estimated at fifty million bushels; in 1810, one hundred million bushels; in 1820, one hundred and fifty million bushels; in 1830, two hundred million bushels; in 1840, three hundred and seventy-seven million bushels; in 1850, five hundred and ninety-two million bushels; in 1860, eight hundred and twenty nine million bushels; in 1870, one billion two hundred and sixteen million bushels; in 1880, one billion six hundred and twenty-seven million bushels; in 1890, two billion bushels; in 1896, two billion two hundred and eighty-three million bushels. Thus it will be seen that the production of corn has increased forty-five hundred per cent. since 1800, and the per capita from twelve and one-half to thirty-two bushels. On the twenty-first of January, 1861, Senator Wig-

fall, in his farewell speech to the Senate, took occasion to say, "Cotton is King," but, in truth the value of the corn crop, as a raw material and manufactured product combined, has exceeded in value not only that of cotton, but of all the other grains as a whole. This may seem startling to many, but when we take into consideration its value as a food for both man and beast; its manufactured and waste or by products such as meal, hominy, starch, glucose, etc., and last, but not least, its use in the manufacture of whiskey and alcohol, then it becomes a question of vital importance to the farmer, that the raw material may be produced at the minimum amount of muscle and money.

We have stated that the corn belt proper was between the thirty-eighth and forty-third parallels in the United States, yet north and south of this, we find the largest yield per acre, as in that sterile and rocky state of Vermont, and the largest yield per single acre, two hundred and fifty-seven bushels, in South Carolina, produced, however, at a cost of over one hundred dollars; showing conclusively that cultivation is the key to the solution of the problem. In this connection we wish to say that while corn demands a fertile soil, plenty of moisture, and a high temperature and is, as is generally regarded, an exhausting crop; yet, as a matter of fact, it takes from your farms less fertility than any other grain produced, as seventy-five per cent. of it is consumed at home, and not in foreign countries.

To have a good crop of corn, seed of the best quality and of the best variety suited to your soil and climate is necessary. Poor seed means a poor stand, and a poor stand means a small crop, no matter how rich your soil, how much you may cultivate, or how favorable the season.

We select our seed when husking, either off the stalk, on standing, corn or in the shock. The ears selected are placed in a box in some high and dry part of the barn until springtime when we look it over and select the best. Having good seed, next comes the site, which will be determined to a great extent by your system of rotation.

I prefer clover sod first, timothy second, and wheat stubble third. Then comes manner and time of plowing, deep or shallow, early or late. In this you must be governed by the character of the soil and time you wish to plant. My experience has been exclusively confined to alluvial and yellow clay soils. On the former I plow deep, say six to eight inches; on the latter four to five inches, if the soil be of that depth, though timothy sod should not be plowed as deep as clover or fallow. On alluvial soils, unpastured clover, or timothy sod, I would plow in the fall or winter; stubble or fallow on both alluvial and clay soils early in the spring, as this holds moisture better. Whether you plant early or late a thorough preparation of the soil is necessary. A good seed bed saves half of the cultivation generally. On bottom lands I find early planting gives best results, say from the fifteenth of April to the fifth of May; on uplands from the twenty-fifth of April to the fifteenth of May. While it is true that in early planting more cultivation is needed, yet with the large and late varieties that we generally plant in the valley, a longer season is needed for growth and ripening, than with the earlier and smaller varieties. In the valley for a general crop I plant bullskin and Loran. On the upland, the Leaming. I plant with a check rower, three to four grains in a hill, three feet ten inches each way. I use the check rower in planting because I can adapt it to either shallow or deep planting, and can cultivate both ways. I like to harrow before the corn is up, provided a rain has fallen soon after planting, and should weeds be plentiful, harrow crosswise the second time.

The easiest as well as the best way to kill weeds is when they have just germinated. At the earliest possible moment I plow, with a double bar share, close and deep to destroy the weeds, if any, to loosen the ground, if hard, and to let the sun in to the young corn. From one to two days afterward I split out the middle or ridge with a double shovel blow going once in the row.

In seven to ten days I go crosswise with a cultivator with bull tongues next to the corn, and not so deep as in the first plowing. After the first plowing I aim to plow shallower each time and farther from the corn, as on examination of the roots I find that in plowing corn of this size four inches from it and four deep you practically destroy more than half of the roots. After the second plowing I thin to three stalks in a hill. In the third plowing I also use the cultivator, and in place of the bull tongues use the large shovel, set to throw a little dirt to the corn. In the fourth I do not aim to plow more than two inches deep, with shovels set to throw more dirt to the corn. In short, level and shallow cultivation give me good results. With this cultivation the corn is partially "laid by," but by no means entirely. Should it be wet and your corn clean, it will be sufficient, but dry seasons and weedy corn are the rule rather than the exception. We use as an after cultivation a tobacco harrow, going once in the row each way and until the weeds are destroyed, and the surface to the depth of one and one-half inches made as fine as possible. This fine surface soil is nature's mulch.

By the above method of cultivation you reduce the weeds to the minimum, bring the condition of the soil to its maximum, and a crop will be produced to the utmost limit of its capacity.

By shallow and late cultivation we have increased the yield on land continuously planted in corn for fifty-two years, without manure of any kind, at least twenty-five per cent. in seasons of unparalleled drouth.

DOES FIFTY-CENT WHEAT PAY?

By GEO. E. SCOTT, Mt. Pleasant, O.

During the few years that there has been a depression in our wheat markets it has been a study with the wheat grower of Ohio whether he could continue this crop as a staple upon his farm.

We find, however, that the acreage has been but little reduced during the past decade, while the price has dropped lower and lower till wheat has passed from the producers' hands into market at fifty cents and even slightly below that price. From what we have observed, in traveling over much of the state, we believe that even should wheat again return to the fifty-cent mark, that farmers cannot eliminate this special crop from their regular rotation, without endangering the future profits on the farm. While it may seem that it is impossible to figure out a net profit from actual sales of grain, and may be the value of the straw thrown in, nor even to meet the cost of production, yet upon what other crop can we depend with which to seed our fields again to grass so that they may not lose their greatly reduced fertility, but on the other hand become more fertile?

We argue that this is an opportune time, while farm produce is low in price and slow of sale, to add fertility to our worn out soils, and we know of no cheaper means than to do so by a three-year rotation making clover and wheat two of three. There is doubtless less exhaustion of fertility by making the potato crop the third of the rotation for two potent reasons, the main one being that each ton only takes out of the soil one dollar and eighty-seven cents' worth of fertility, while corn will extract nearly eight dollars' worth during the same period of growth.

Where clover turf is turned under for corn it requires great fertility within the soil to insure a fair crop of wheat if drilled to that crop from the corn stubble. In many localities this is impractical and the corn stubble must be seeded to oats the following spring, thereby prolonging the rotation to four years and again extracting

about seven dollars and forty-five cents worth of fertility for each ton of oats raised.

For the enlightenment of our farmer friends who feel the need of still holding on to wheat as a cash crop, let us figure a little and see what it will cost to grow a crop of wheat averaging twenty-five bushels per acre.

TABLE I—COST OF SEEDING AND GARNERING ONE ACRE OF WHEAT ON POTATO GROUND.

Clearing of weeds and vines.....	\$0 40
Harrowing	0 50
Drilling.....	0 50
Seed, 7 pks. at 75 cents per bushel (graded seed).....	1 30
Cutting, hauling and threshing.....	3 20
Fertility absorbed by 3,000 pounds straw and 1,500 pounds grain.....	8 80
Tax and interest on land.....	3 80
Total cost.....	\$18 50

TABLE II—COST FOR ONE ACRE OF WHEAT ON CORN STUBBLE.

Add 20 cents to Table I for preparation of ground.....	\$18 70
200 pounds pure bone (ground).....	2 80
Total cost.....	\$21 50

TABLE III—COST OF ONE ACRE OF WHEAT ON OATS STUBBLE.

Add to Table I two dollars for preparation of ground.....	\$20 50
200 pounds pure bone (ground).....	2 80
Total cost.....	\$23 30

TABLE IV—RECEIPTS OF ONE ACRE.

25 bushels wheat @ 25 cents per bushel.....	\$12 50
3,000 pounds straw @ \$2.70 per ton.....	4 00
Total receipts.....	\$16 50

In the case of the wheat after potatoes, there is no need of the bone as the second growth of clover and liberal addition of stable manures added during fall and winter prior to turning under for potatoes gives all that is necessary in the way of extra fertility, hence a reduction in cost of production by a short rotation, and the extra tillage given the soil while harvesting the potato crop.

The reader may ask, "Why will not the short rotation from corn to wheat give the same results as above without the addition of the two hundred pounds of bone?" Because the corn crop has taken out of the soil over six dollars' worth more fertility per ton than has each ton of potatoes, beside lacking the extra tillage that the potato soil receives. Yet we are satisfied that even this way will give a cheaper production of wheat than to continue one year longer in an oats crop.

It is plain to be seen that an Ohio farmer cannot afford to plow ground with the expectation of raising wheat for fifty cents and getting profit out of it, but we cannot let our farms stand idle and pay taxes on them, hence we must do the next

wisest thing, which we think a majority of farmers are doing, and that is to follow regularly the turning under of a clover turf, as soon as possible, with a crop of wheat. With a yield of two tons of clover hay per acre, valued at eight dollars per ton, when compared with other fertilizing elements, the same fed out to stock upon the farm will bring at least that amount, if consumed economically, and leave three-fourths of its manurial value, if properly husbanded, to be replaced upon the soil again. Also the second crop for seed, or turned under the following spring, will add immensely to the fertility of our soils with the humus to renovate and make it friable and porous ready to let the air into the roots, hold more water and lessen labor. While it does appear that we grow wheat at a substantial loss at fifty cents per bushel, there are other factors which greatly lessen that loss when taken into our crop rotations.

Farmers substantially say, by their continuing to seed the usual acreage to wheat, that success in farm operations depends upon rotating with winter wheat, and other crops along with farm stock must make up any deficit that a crop of wheat may inflict.

In conclusion, let us summarize on three acres with soil and conditions alike for a three-years' rotation.

First—Two tons clover hay.....	\$16 00
Two bushels seed.....	10 00
Haulm for feed.....	2 00
	<hr/>
	\$28 00
Cost of production.....	\$10 00
Net profit.....	\$18 00
Second—150 bushels potatoes @ 25.....	\$37 50
Cost of production.....	\$18 00
Net profit.....	\$19 50
Third—25 bushels wheat @ 50c.....	\$12 50
3,000 pounds straw @ \$2.70.....	4 05
	<hr/>
	\$16 55
Cost of production.....	\$18 50
Net loss.....	\$1 95
Total profit.....	\$35 55

Aside from this profit for these three acres in one year, or one acre in three years, there is an increase of fertility through the nitrogen taken from the air which is truly net gain, and a resource of fertility occasioned by disintegration brought about by labor and skill, charged against the crops, along with fertility pumped up from the subsoil by clover roots of which no real estimate can be given in dollars and cents.

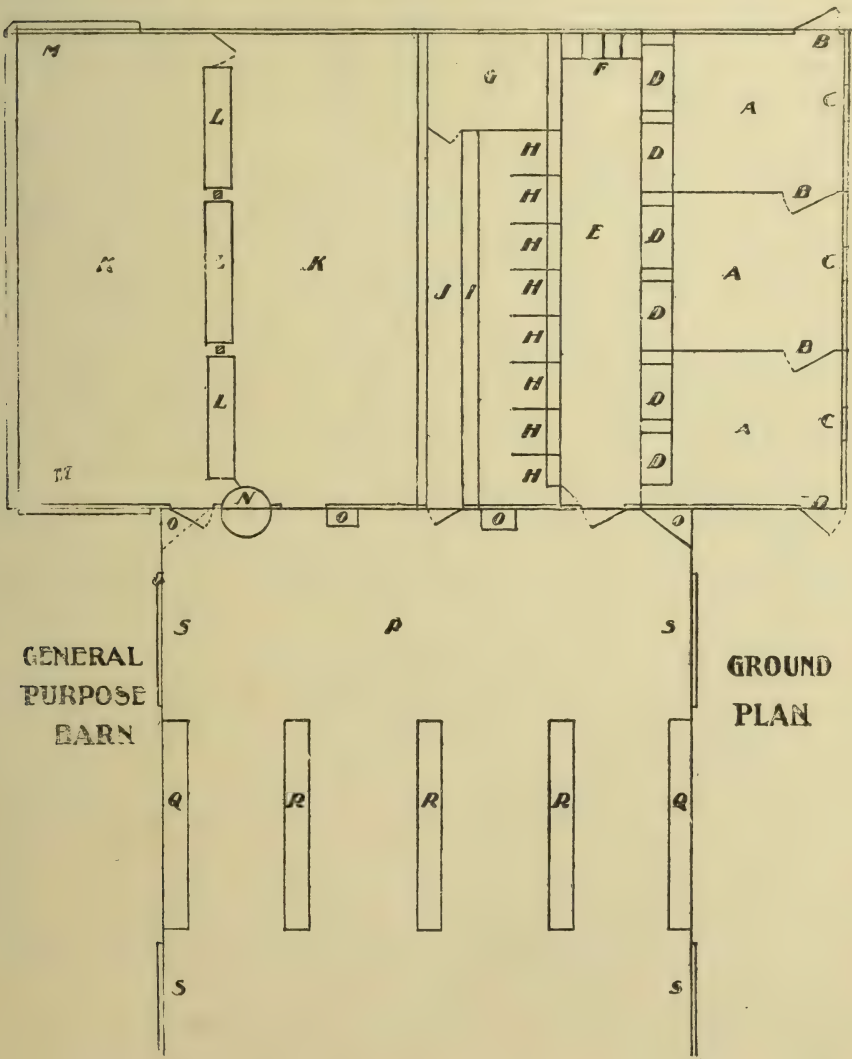
The thinking, practical farmer understands these silent agents working beneath the green covered soil when kept unexposed to the climatic changes of a north temperate zone, and while it seems impossible to figure out a net profit from visible, tangible things that grow out of the soil he has found that through some silent influence he manages to live in peace and await the time when the business prosperity of our nation shall no longer demand fifty-cent wheat at his hands. Wheat is the natural product of the Ohio farms which we, as farmers, will continue to grow because we cannot farm without the straw it produces.

A GENERAL PURPOSE BARN.

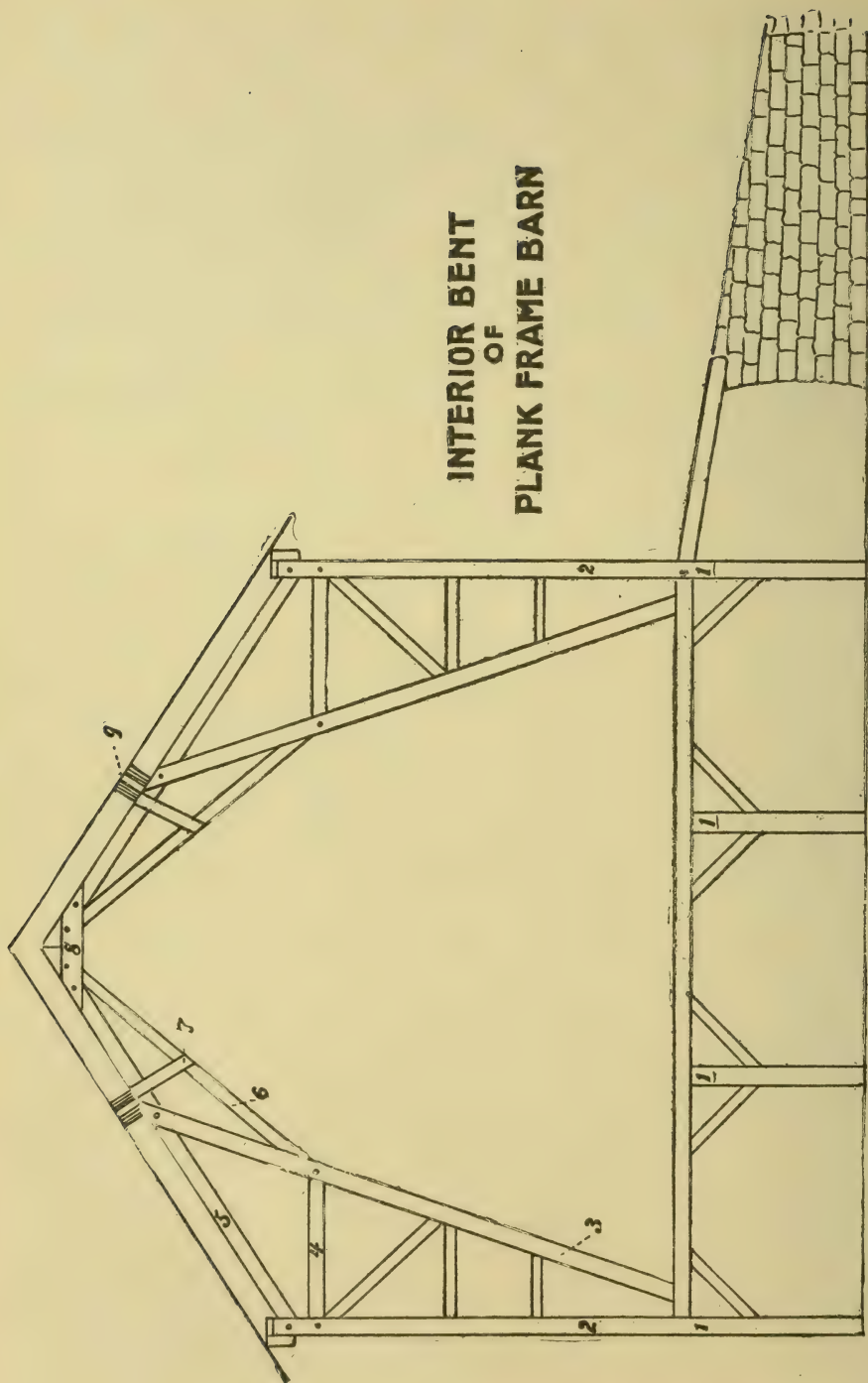
By JOHN L. SHAWVER, Bellefontaine, Ohio.

Every prudent farmer desires a barn sufficiently large to provide shelter for all his stock. If he be a specialist he wants a barn fitted especially for the kind of stock he handles, but if he be engaged in mixed farming he will want a general purpose barn—one that will accommodate a few horses, a number of cows and a flock of sheep. Of course he wants things so arranged as to be convenient and enable him to care for this stock with the least possible amount of labor.

Having given this subject considerable investigation, and having made it an object to visit many of the best barns in this and adjoining states, I believe the ac



INTERIOR BENT
OF
PLANK FRAME BARN



companioning plan will be found to possess as many advantages as can usually be found combined in one plan. It represents a barn thirty-six feet wide and sixty-four feet long. There are three large box stalls, "A," which will accommodate six horses. These are connected by doors, "B," and are lighted by windows, "C." The mangers, "D," are built directly above the sill and diverge towards both stables and feed room. The manger thus built occupies less room and suits the requirements of both animal and owner. The feeding alley, "E," is between horse stable and cow stable, so that both may be fed in a very few moments' time and with very few steps. The small boxes at "F" are feed boxes filled from large bins above the driveway, by means of spouts. The bulk of the feed is thus out of the way, while the small boxes which never get empty are convenient of access.

There are eight cow stalls, in addition to the box stall at "G," which will be found very convenient in more ways than one. "I" represents the manure gutter and "J" the walk, three feet wide. The gutter should be sufficiently deep to prevent the cows stepping into it and never so wide but that both cows and attendants may easily step across. "K" and "K" are sheep stables separated by the feed racks at "L," which are portable. "M" and "M" are large doors through which the manure spreader or wagon may be driven when the stables are to be cleaned out. Grain boxes are provided about the sides, so constructed as to prevent the sheep standing in them.

"P" is a covered barnyard, forty feet wide and of any desired length. This communicates with the cow and sheep stables as well as with the horse stables. Here the manure is accumulated and saved from loss through exposure to rain, air and sunshine. The loft above receives the straw directly from the threshing machine, which being kept perfectly dry and bright is doubly valuable. From this loft the straw feeds down into the racks at "Q" or is pushed through the chutes at "O" "O" "O" into the various stables for bedding. "R" "R" "R" are racks for feeding corn stover or hay. "N" is the watering tank, accessible to both sheep stables and the covered barnyard.

Such a barn may be built very cheap by constructing the frame of plank. This system not only saves from one-third to one-half of the timber, but saves from seven-tenths to nine-tenths of the cost of framing the barn. Each of these items is well worth consideration and when, in addition, one gets a stronger, more durable and more convenient barn, the value becomes more greatly enhanced.

The truss work for supporting the roof not only provides great strength, but it avoids any timbers which would interfere with the use of the horse fork or hay and grain slings. It also provides for a clear floor space over the entire floor of the superstructure.

These frames may be built with a curb or gambrel roof, if so desired, by giving the roof supports sufficient pitch, permitting the purlin posts to extend past them, intersecting with the stays at any desired point to give half, three-fifths or two-thirds pitch for the lower span and any desired pitch for the upper span.

The basements may also be constructed of plank, but they have not yet been sufficiently tested to warrant me in recommending them for general use, though I believe they are as strong as when made of square timber.

NEGLECTING OUR OPPORTUNITIES.

By O. J. VINE, Canton, Ohio.

On every hand we hear the complaint, "Farming don't pay." Do those who are so ready to complain ever stop to consider that perhaps farming is unprofitable

because of their own neglect and carelessness? Very few farmers apply good business principles to their vocation; they go on, year after year, in the same old rut, with scarcely a thought as to how they might improve their methods, and by so doing, produce better crops at a smaller cost. This is really the solution of the problem, how to make the farm pay better.

If prices are low, we must reduce the cost of production in the same proportion. One difficulty with many farmers is, they do not read and think as they should. They forget that this is an age of progress; they sneer at new methods, agricultural papers and farmers' institutes as "book farming," and imagine they know more than any one else. They say money spent for books and papers is wasted, yet they will permit enough to be wasted on their farms every year, by ignorance and mismanagement, to purchase a good library. Farming certainly requires the exercise of all our business qualifications, knowledge and judgment, if we expect to make it profitable.

One of the most serious mistakes is in the management of the manure. My observation leads me to say that not one farmer in a hundred in Ohio, takes the proper pains to save the amount of manure he could or should. I am certain that with a little extra care and effort, the amount of manure made each year, might be doubled, and in many cases quadrupled, and be improved in quality. If, instead of feeding stock in the open fields during the winter, the farmer would stable them carefully and bed them liberally in order to absorb all the liquid manure—the most valuable part as it contains the most nitrogen—he would be surprised to find how much more manure could be made in a year. The manure heap is the farmer's deposit bank; if his "account" is large, and he makes judicious use of it, he can expect to grow large crops. By proper effort, the farmer can produce enough home-made fertilizer, and need not depend upon commercial fertilizer, to maintain fertility. The purchase of commercial fertilizer involves a direct outlay of money, which the farmer can ill afford to sustain. On some soils commercial fertilizers do very well, on others they do but little good. Barnyard manure is always reliable, it never fails to show good effects. Like all fertilizers, it does the most good in wet seasons, when there is an abundance of moisture to render it more soluble, as it is only in a liquid state that plants can utilize it. We need to be constantly on the alert to maintain the fertility already in the soil, and add to it, whenever possible. Fertility, drainage and tillage are the key-notes to successful farming, and if we do not perform our part, we ought not to complain if profits are small.

I advocate and practice stabling stock almost constantly during the winter, and half the time during the summer. The manure should be removed daily, and unless taken directly to the field, as is practiced by many good farmers, should be heaped up in a small, compact heap, to prevent leaching. Instead of this, many allow it to be thrown promiscuously over a large yard; all the rain, and perhaps the water from the roof in addition, falls upon it, and leaches it, while the cattle tramp it into the mud. It loses from 10 to 50 per cent. by lying in the yard from six to ten months before being applied to the fields. This loss might easily have been avoided by a little care and judgment in the handling of it. The dark colored stream, that finds its way to the neighboring brook after each rain, shows the loss sustained.

The practice of feeding stock out of doors in winter cannot be too strongly condemned. Not only does it require more feed to support an animal in that way, but so much of it is wasted by being tramped under foot, that cattle will refuse to eat it. Feed is too expensive, even when low in price, to be wasted in that way, when by providing comfortable shelter it can be made to do so much good. The loss may seem small to each farmer, but in the aggregate it is enormous.

In many cases, much fodder is wasted by careless handling in the field. Hundreds of acres are left standing uncut in the field every year, the greater part of

which is practically wasted. True, stock is usually turned into the fields to eat it, but during the fall and winter the ground is apt to be so wet, much of the time, that the injury by tramping is greater than the value of the feed.

Fully half the feed value of the corn plant is in the stalk, blades and husks, after the ear has been removed, provided it has been properly handled. In order to make the most out of it, it should be cut and carefully shocked at the right time, husked early, and the fodder stored under cover or well stacked. The best feeders cut or shred it before feeding. I have practiced shredding for many years, and would not think of feeding any fodder without. A great deal of corn is shocked so carelessly that in a short time much of it will be lying on the ground; and by midwinter, if not husked sooner, both corn and fodder are badly damaged. Within a half dozen miles of Columbus, I saw in December last, an entire field of fifteen or eighteen acres, that had been husked and the fodder left lying loose where husked, apparently with no intention of saving it, as it had been lying there for some time, judging by its blackened appearance. The value of that amount of fodder properly cared for and fed would have been from seventy-five dollars to one hundred dollars—all wasted for want of proper management. The owner would perhaps have complained of hard times, and been insulted if told that he was helping to make them so.

THE SOILING SYSTEM.

We neglect opportunities for increasing profits, when we persist in maintaining so much useless fencing on our farms. As we increase expenses, we decrease profits. Fences add very much to our expenses, and the most of them can be dispensed with. They are a luxury that few farmers can afford to indulge in. If one is so situated that he does not wish to adopt the soiling system entirely, he can adopt it in part, by removing many of the inside fences, thus reducing the amount and saving time and labor in cultivating crops. It is an established fact that much more work can be done with a team in the same time, in a long, narrow field than in a square one of the same area, because there is so much less turning. It is so much easier too, to clean those neglected strips where the fence has stood by removing the fence, plowing and cultivating than any other way. Those old fence rows are a great nuisance; they are generally grown up with briars, and filled with rubbish as they usually are, they look bad, and serve as a breeding place for noxious weeds and insects. The land that is thus wasted, or in many cases worse than wasted, on the ordinary farm would, if properly utilized, support the stock on the same farm during the pasturing season. Where land is high in price, and so situated that it can all be brought under cultivation, the soiling system will, in time, be adopted almost entirely. Where land is expensive, we cannot afford to let from three to five per cent. of it lie idle, in fence strips, to say nothing of the cost of building and repairing the fences. After giving the soiling system a thorough trial, I would not permit any one to fence my farm again if he would agree to build and maintain the fences for ten years free of all expense. The only fences we maintain or expect to maintain, are around the orchard, that is used also for a poultry and hog yard, the barnyard and meadow, with the adjoining woodland. The meadow is too uneven and badly cut up by a large stream for cultivation. It is an ideal pasture, where stock can find water and shade at pleasure. With me, the soiling system has come to stay. I am only sorry I did not practice it sooner. The advent of the silo, has made it easier to practice than before.

BETTER STOCK NECESSARY.

We frequently err in not keeping a better class of stock than we do, and in not giving it better care. It requires less feed to produce a given number of pounds of

flesh in a thoroughbred animal than in a scrub. The former will command a better price per pound than the latter, because it is better finished and there is less waste in slaughtering it. The cost of getting a start in raising thoroughbred stock will be greater than in raising common stock, but it would be better to buy less and buy something better.

There is a certain satisfaction, too, in raising and keeping fine stock. But it must be remembered that thoroughbred stock will not thrive under scrub care. The better the stock, the better the care must be, to insure profit. There is still money in good stock, properly handled, even though prices are low. It is better to keep on raising stock at present prices than to discontinue and in a few years be obliged to buy. Farmers should aim to be producers and sellers of stock at all times, rather than purchasers. Raising stock requires no direct outlay of money, but to purchase it does.

IMPROVING THE FARM.

Because prices have been low and money scarce, farmers have become discouraged, and in brooding over their condition have not kept their farms in good shape or the buildings in good repair. A general air of untidiness and carelessness pervades the premises. Fences are not repaired, fence rows become overgrown with weeds and briars, buildings are unpainted, heaps of rubbish accumulate, broken wagons and machinery are scattered about the premises and add to the general air of recklessness. This is all wrong. We should aim to keep everything neat and tidy and improve a little each year. We ought to be progressive. It is not necessary that the outlay of money be large or that we erect new and expensive buildings. Even old buildings can be made neat, home-like and attractive by a little effort. When the windows are filled with beautiful plants, the tables with good books, that elevate and refine the mind, and contentment, kindness and sympathy prevail, we have an ideal home, whether the dwelling itself be plain or pretentious.

FARMING ON PAPER.

By C. G. WILLIAMS, Gustavus, O.

We hear a vast deal of criticism, one time and another, of the man who "farms on paper;" the man who can farm better on paper than he can on the best clay loam of our most fertile valleys; the man who can tell how things ought to be done, but who never finds time to do them; whose farming operations are always expressed in the future tense—"I shall have done thus and so by next week," or "by the time this article is in print;" or "I shall do that when I get home from this visit," or "this institute trip." A vast deal of criticism, I say, of the "paper farmer," the "book farmer," the "sidewalk farmer." Just criticism in the main, too. Criticism that you farmers are abundantly able to apply without any assistance from me, so I shall confine myself for the most part to other phases of the question.

I think that the successful farmer of to-day must do much farming on paper. In what ways? In the first place let me call your attention to the fact that the farmer is manager, or joint manager, for the wife should be counted a member of the firm, of a portion of the world. He acts not only as chairman, but helps to make up the full membership of a "Ways and Means Committee" that has every whit as important duties and responsibilities as the most important committee of our national congress.

Up in our part of the state we find we are in pretty much the same condition, too, as our national congress; we have not provided sufficient revenue to meet our usual expenses—our unusual taxes.

A good many of us are scratching our heads and wearing out lead pencils figuring on next year's "budget," as our English cousins speak of the financial estimates and plans of their government. Please do not ask me how we are making out, for that is another story.

Here we are, then, at the close of an agricultural year. We have our receipts in so far as we have marketed our crops for the season just past—that is unless we have neglected to "farm on paper" to this extent. We should also have a detailed statement of our expenses. With these receipts and expenditures as a guide, what about the plans for next season? What changes shall we have to make in order that our receipts may equal, yes, and go somewhat beyond our expenses?

This, then, I would mention as one of the first ways of farming on paper; a careful estimate of probable receipts and expenses for the coming year, using the past as a guide, for you know "the garment has to be cut according to the cloth." This may seem to you not so very important, but the men who are making a little money, even during these hard times—and there are a good many who are—consider this of great importance.

A second use for the paper and pencil is in determining the cost of production. No business is on a safe basis without this knowledge. No business aside from farming would survive at all without an accurate knowledge of the cost of production. This is a sort of knowledge at which we cannot arrive by mere guess work. When wheat gets down to fifty or sixty cents a bushel, corn to eighteen and twenty cents, potatoes to fifteen and eighteen cents, butter to twelve and fifteen cents in the middle of winter, milk one-half cent a pound for about a half of the factory season, it is high time that we find out whether there is profit or loss in a given article of production. If we are producing at a loss, the sooner we haul in sail the better. To be sure some especially unfavorable circumstances may result in the growing of a particular crop at a loss for one season when all the probabilities would be against a similar loss at another time. For instance, take wheat in Ohio the past year. I suppose that very little wheat was grown at a profit, for the farmers had largely sold out before the recent advance. It does not follow, however, that wheat will not be grown at a profit next season, not taking into consideration the advance. And we may not all find matters in as bad shape even this year as we imagine if we get at the actual facts. Take my own wheat crop this year. That seeded the middle of September, 1895, after oats, was almost a total failure. I harvested only six bushels per acre. This would make the wheat cost me just one dollar and ninety-five cents a bushel, saying nothing about the clover. That grown after potatoes (seeded early in October) cost me fifty-one cents per bushel. But I harvested some twenty-six tons of second crop clover after the wheat; I know of no reason why this should not be credited to the field. This clover was worth, after deducting the expense of harvesting it, six dollars per acre on the oats stubble wheat, and three dollars per acre on the other. Revising my figures in the cost per bushel of my wheat harvested the past year I find it was, for the oats stubble, ninety-five cents instead of one dollar and ninety-five cents, and for the potato stubble thirty-two and one-fourth cents instead of fifty-one cents; or, averaging both rotations (there were not equal amounts of each) I find the cost to have been forty-three and one-twelfth cents, practically the same that my wheat cost me the year before when I had twenty-seven to thirty-five bushels per acre. What was lost in the wheat was gained in fairly good clover hay.

And, as with wheat, so with the rest of our products, we should know somewhere near what they all cost us.

I said that if we were producing any article at a loss the sooner we slowed up the better. I do not apprehend that it is the part of wisdom to cease production entirely, changing to something with which we have had no experience; sacrificing a line of agricultural implements and purchasing new ones at full market price, only to find in a year or two that thousands of other farmers have done the same thing, and then move on to something else again. Do not cease production entirely but simply "slow up." If we farmers could only get at it to hold agricultural production somewhat closer to the needs of consumption we could have a little something to say about the price of agricultural staples. I fear that until we can come to an understanding in this direction we can never make the success of our business that the rest of the industrial world do of theirs. For myself I would much rather grow fifteen hundred bushels of potatoes at fifty cents a bushel than to grow three thousand at eighteen cents. If we will farm on paper enough to know what it costs us to produce our crops, which of our crops there is the most profit in, we shall know along what line it will be wise for us to "slow up," and along what lines it is safe to maintain, or increase, it may be, present production.

I appreciate the difficulty here; the many things that have a bearing on this question, all of which must be considered.

The agricultural situation just now is terribly confusing to the best of us; we hardly know whether to redouble our efforts or curtail them. It is altogether probable that the farmer who knows what he has done and what he is doing, who has farmed somewhat on paper, if you please, will make the wiser combinations. And right along with this knowledge of the cost of production, which can be determined only by keeping an account with each crop, should be mentioned the necessity of keeping some other simple accounts if we would know with any certainty "where we are at." We want surely to keep a cash book which shall show all receipts and expenditures of money. And if, as is likely, we are having more or less deal in which exchange is not always accompanied by cash we shall need to keep a record of these transactions from day to day in some book, or part of a book, especially for that purpose. I am not "up" in the technical terminology of the bookkeepers, but I think they call such a record a "day book." It might be a little out of order with our less frequent transactions to call such a record a *day* book, but whatever we call it we will do well to use it. From this miscellaneous account we may find it desirable to sort out from time to time all items that concern the same individuals and give each a page by himself. Personally, I want to say that I get no little satisfaction from my yearly invoice of property of every sort. I commenced this six years ago and would not think of discontinuing it. You can never tell how you stand at the end of the year financially by simply counting the cash in your pocket. If you have never done so before, when you reach home from this institute, make a careful list of all your property, both real and personal, indoors and out. If you have never made such a list and consequently have no old one to refer to you will keep thinking of something you have omitted, for several days. Then fix the value of the separate items as nearly as you possibly can. Not necessarily the value which an article would bring at sheriff's sale from bidders who did not want the article in question, but perhaps what you could actually replace the article for. In my own invoice I prefer to under value an article slightly rather than over value it.

Then make a list of all your debts of every sort, and don't forget any unpaid interest which may be due. From the sum of all the first items, or your assets, subtract the sum total of your liabilities (and I sincerely hope that you all can make a subtraction of this kind), and I suspect that very many, if not the most of you, will be surprised to find that your financial condition is as good as it is. But whatever the result, is it not a satisfaction to know the facts? It is not only a satisfaction, it is an incentive to better things. Keep this up for ten years and I will guarantee that you will be worth more than you will if you do not do it. And the value to

you of these annual invoices will increase in proportion to the number of years which they cover.

I think we farmers will do well to adopt another custom of the business world and keep our money on deposit at the local bank, for most all rural communities have easy access to a bank these days, making all cash payments by check instead of money. A check book kept properly filled out is almost equal to a cash book, and then the return of the check when canceled is the best kind of a receipt. Probably most of the farmers present handle what little money they get hold of in this way. When we, as a class, have established a reputation for keeping our cash in the bank instead of under the carpet, or in the chimney, we will not read of some one being tortured to reveal its hiding place, as we do now quite frequently.

And now a word as to keeping accurate records of knowledge gained from past experience. It seems a very simple thing to carry in the mind certain results that impress us very strongly for the time being. We think we can call up these facts whenever we wish but the first thing we know they are gone. We can remember that a certain practice either helped or injured a crop but for the life of us we cannot remember which way it worked. It is a little like the weather breeding propensities of the new moon. Some say that if the powder horn can be hung on the lower corner it is a dry moon; others maintain that this particular inclination insures wet weather. Not being a meteorologist, or even an ordinary "weather prophet," I would not care to express an opinion here, but I am sure of myself when I counsel you to trust nothing to memory. Keep records of your experiences. There is not a season that goes by but what some valuable facts are acquired. Sometimes this new knowledge calls for a revision of something we had regarded as settled. The differing seasons all have something to say to us. We can handle these facts carelessly, thoughtlessly, letting them pass in one ear and out the other, or we can make them a part of our growing selves. The tendency of the one course is toward less successful farming and poverty; of the other toward what Spencer would call "a better adaptation to one's environment;" a better meshing of the cogs we might perhaps say; more and better results from a given amount of work; more profitable farming, greater prosperity and happiness; all growing out of farming on paper. But some of you when you have considered my subject—"farming on paper"—doubtless have been thinking of the mere "theorizer" as compared with the "working" farmer. The theorizer is in bad repute, and as I intimated in my opening remarks, in the main, justly so. We see so many sad examples of the man who can "figure out" profits so handsomely, but who fails to "work out" anything. His theories were not practical, we say. Bad theories mean bad practice. Yes, and good theories ought to mean good practice. The only *sure* way to tell a good theory from a bad one is by practice. As farmers, then, the question comes home to us, how much of our time can we afford to devote to the testing of theories, our own, or somebody else's. I think we can afford to devote some time, but the question is, how much? Some of us go to one extreme and some to the other. From observation, I believe that worse failures have come from too much testing of theories than from too little.

There is no necessity in this day, at least, for the average farmer overdoing the theory testing business. The government is at work along this line. I refer to our experiment stations. With their large appropriations they do not *have* to make their operations pay financially. They can take risks which the farmer cannot afford. After they have blazed the way we can follow, holding fast to our common sense, and, in a small way at first, prove, or disprove the value of their conclusions as applied to our own circumstances. This much we can afford to do. Perhaps it would be safe to say that we cannot afford *not* to do it.

In our institute work we get, if possible, a little closer to the farmer. The State Board of Agriculture aims to send to you men of experience in certain lines, and

it expects these men to give that experience along with a little "farming on paper."

Now don't think that I would deride theory, and don't you do it, for theory is the basis of all of our practice. You may not be conscious of theorizing much but your every practice has had its origin in somebody's theorizing, speculating and planning, if not in your own. That much scoffed at theory of old Jethro Tull, that "tillage is manure" has come down the hundred and fifty years since it was uttered, and the fine tilth of Ohio wheat fields of to-day is due in no small measure to it, although we may be ignorant of both the man Tull and his celebrated dictum.

I have briefly called your attention to some ways of farming on paper which I think are essential to our greatest success. The first was what I have been pleased to call the "Ways and Means Committee" work—the farm plans for the coming year. No matter how carefully planned and far reaching our rotation, events come up which upset it. For instance, the wet weather this fall cut down the wheat area of my township fully one-half the usual acreage. I succeeded in seeding only one-fourth my expected area. This means a shortage in my income next year of three hundred dollars to four hundred dollars, which will have to be made up in some way or there must be a corresponding reduction on the other side of the ledger. The proper thing for me to do now is to anticipate the situation which I shall be in next September, provide for it, if possible, and thus avoid an issue of bonds.

The other considerations which I have submitted to you have had to do with the knowledge of the cost of production; the keeping of accurate and simple accounts of all transactions, not forgetting the annual invoice of all one's property; and the untrustworthiness of memory in preserving valuable experience.

Now, plan as we may for success, and few there be who ever meet with success without planning for it; peer into the future as best we can, using, of course, that old Patrick Henry lamp, we run up against something continually that surprises us. A few years ago, in an editorial in his paper, the Boston Commonwealth, Dr. Edward Everett Hale called attention to a letter of advice which Prince Albert wrote to his daughter, the mother of the present Emperor of Germany. The letter was written shortly after the marriage of the Princess, and is full of that good sense and prudence for which Prince Albert was noted. He was counseling her in regard to the "devil of debt," and how she should avoid it, when he made use of this sentence: "Make your plans for only one-half your income; Mr. Unexpected will take care of the other half."

"Mr. Unexpected" is a gentleman we have all met. Not a season goes by but his unwelcome presence confronts us here and there. One season it is Mr. Unexpected Flood; another, it is Mr. Unexpected Drought, and of bugs his name is legion. He has perhaps struck the most terror to the heart of the farmer in the last three years in the form of Mr. Unexpected Low Price. I introduce the unexpected gentleman in conclusion because he is a factor which we all have to take into consideration. Not doing so has cost many a man his all. If, in our plans, we prepare in a measure for him we shall lessen his power to harm us; and if we take into consideration the changing influences he exerts from year to year our estimates of the cost of our crops and records of experience, etc., will be the more valuable.

THE SUGAR BEET.

By W. W. REYNOLDS, UTICA, O.

[Read at the Farmers' Institute held at Utica, Licking county, February 24 and 25, 1897.]

We are a large family of seventy million people living in the United States. This family has a valuable farm.

There is a family owning a farm called Canada on our north line and a Mexican family joins line fences with us on the south.

Across the Pacific there are Japanese, Chinese and other families. East of us there is an English family, a German one, a French one and some others, all owning good farms.

The object of the principal part of the members of these families is to make money and secure comfort. This paper is on money.

We referred to the worth of our farm. It is the most valuable one in the whole world. Through the indiscretion of some of our brothers in the early sixties there was a large mortgage placed on it, and again in the past few years two smaller ones, but you know that our incumbrance is small compared with our real estate and personal property.

You will acknowledge that it is business sanity for the owner of a farm to produce everything possible for the support of his family and have a surplus to sell. We have done so with some products only. We have sold cotton, wheat, flour and meats, but have bought wool and sugar. This paper is about sugar only.

The Sandwich Island family, with the help of Chinese hired hands, our Cuban neighbors, and the sons and daughters of the steady German and French families, produce sugar for us. Our Louisiana brothers produce two hundred thousand tons yearly from cane; we buy from our neighbors one million, eight hundred thousand tons yearly; so we buy the use of their soil and pay them the price of their labor on their own farms.

Again our farming is not enough diversified; our corn field is too big; so is our wheat field. We are producing too much of some of the things we need and too little of others.

To illustrate the evil of this, let us imagine that we raise corn only; that we throw the United States into one field and put the whole field in corn. Corn would be worth a cent a bushel, but nobody would have the cent. That illustrates our present condition. We know all the alleged and real causes of hard times.

We have fallen into the most disastrous times ever experienced. This condition has been brought about by our grain field being too large, our sugar field and our sheep pasture too small, and our steady, good workers, employed or unemployed buying the products of other peoples' labor. We pay one hundred and twenty-five hundred thousand dollars yearly for sugar.

Our brothers who have had charge of the part of our farm adapted to the growth of sugar cane have had a good deal of encouragement and some discouragement; but it appears they don't supply us. As we said before, they produce but one-tenth of our yearly need, so we have looked around and find that if we want to have sugar of our own raising on our table we must, like other civilized nations, cease depending on cane. We use nearly as much sugar yearly as the world produces from cane. The consumption of sugar is steadily increasing but the production of cane sugar is gradually decreasing. Our German and French neighbors, who are no more shrewd on an average than ourselves, and have no better land and not so much of it, raise their own sugar and in addition sell one-half million tons a year to us, and they get it from the sugar beet. This beet looks like other beets and analyzes about the same in chemicals except that it is much richer in sugar.

Civilized man calls for more sugar yearly. Formerly it was only a luxury; now it is a food, a necessity. Providence, no doubt, foreseeing this, provided the vegetable under consideration, so this necessity could be secured by man in every zone but the frigid.

Here are some facts on how the beet succeeds on our farm. Our government agriculturists, prompted by the agitation of farmers and business men, who noted our increasing consumption of sugar and the success foreigners were having with the sugar beet, sent two thousand, four hundred and twenty-eight packages of seed

to good men in forty-three states and territories in 1893, with directions for planting and cultivating, and instructed the growers to return reports on the yield per acre, and samples of the beets for analysis. This was the first move in the right direction. From a large percentage of the tests, the evidence is firmly fixed in the minds of many, and is on file at Washington, that there is enough land in the United States suitable to produce sugar at a profit to supply the world. (See United States Department of Agriculture Bulletins.)

The sugar beet was on the high road to success; immediately there began an increased interest in it. Seed was planted and cultivation began by a host of farmers. Two factories were in operation, and before the interest died five more were erected. For some reason it stopped suddenly and there has not been a factory erected since, and no interest in the beets until lately.

It is stupid, yes criminal, for us to raise grain in competition with the cheapest land in the world, then take part of our proceeds to purchase sugar produced on the highest priced land in the world, especially when we are producing but one-tenth of our supply or one-thirtieth of the world's production and are consuming one-third of it. Can't we look at this from a pocket-book point of view? The world produces yearly about two and one-half million tons of sugar from cane and three and one-half million tons from beets or six million tons total.

We use two million tons or one-third of this total. Why don't we produce it on our own farms, by our own labor? We are a sweet people; we like sugar. We use sixty pounds yearly for each man, woman and child. Why don't we raise that sixty pounds instead of only six pounds of it as we are doing at present?

This beet, if produced in quantities of ten tons per acre with a sugar analysis of ten per cent., is profitable; twelve tons containing twelve per cent. is but a moderate yield.

If the soil is adapted to its growth this amount may be raised where forty bushels of corn can. The price paid for these is four dollars per ton at the factory, except in Nebraska, where the state pays a bounty of one dollar per ton and the factory pays five dollars per ton. With good soil and first class climatic conditions twenty-five tons can be produced from an acre. Compare twenty five times four dollars or twenty five times five dollars with one hundred bushels of corn at fifteen cents.

There are seven factories in the United States, the nearest is at Norfolk, Nebraska. To show the condition of farming there, I have a letter here from H. D. Kelly, a friend of boyhood days and an attorney there. He says, "Land is worth in a radius of five miles from Norfolk, from fifty dollars to two hundred dollars per acre, according to the distance from the town and factory. It rents from five dollars to eight dollars per acre; wages to common laborers from one dollar and twenty-five cents to one dollar and seventy-five cents on farm and in factory—skilled labor from two dollars to five dollars."

There is no reason why such conditions should exist in a few places only. We want many more such, so that their presence may influence a better price for grain, stock, land and labor and the welfare of the whole people. These beets can be raised as easily as any cultivated crop; they can be produced in quantities according to the strength of soil, the kind of season and quality of tillage. Land that will produce fifty bushels of corn will return fifteen tons of beets, that is, less than one and two-thirds tons of grain against fifteen tons of vegetables. Eight tons of these contain one ton of sugar. The refuse after the extraction of the sugar can be fed to animals. There is no fear of depreciation of the soil. Fifteen tons of beets will contain forty-five pounds of nitrogen, twenty-one pounds of phosphoric acid and one hundred pounds of potash. Fifty bushels of corn contain fifty pounds of nitrogen, seventeen pounds of phosphoric acid and fourteen pounds of potash. Very little of these plant food essentials enter into the sugar; much is left in the refuse for feed-

ing or to return to the soil, so there is little or no loss in fertility. It is also found that the saving of the tops in a silo will pay the whole cost of harvesting.

The beet sugar industry cannot be sprung into existence instantly; the sugar cannot be extracted and manufactured except by the use of a large amount of machinery. A factory costs above two hundred thousand dollars and will not be located until capital is satisfied that it is likely to be profitable. Both home and foreign capitalists are ready and willing to invest in factories as soon as they can. Germans with money realize that it is possible to produce sugar here and we should not say to them "You can't play in our yard."

The principal thing necessary to induce the location of a factory is to convince capitalists that they can get the beets. To do this in such a manner that all who afterwards will be concerned in the success of the undertaking will understand the character of it, a large number of farmers should each raise one-fourth acre of beets the first year and more the next year; have some of these tested and keep the tests; continue this until the farmers feel sure that they can raise them and would feel safe in entering into an obligation, agreeing, in consideration of the location of a factory to raise twenty-five hundred acres each year for say, five years, providing, of course, against very adverse climatic conditions, etc. This plan will be almost sure of success; if not, there will be nothing lost since the beets are a splendid feed for stock.

The length of time for a community to get on its feet in this industry is three years. You may think this a good while, but when you shall wake up to the fact in the near future that we have no good horses and that they are high, you will find that it takes six years to raise a horse. It took Licking county sixty years to breed, study and select the sheep we had in quality and quantity a few years ago, and few of us will live to see the same again.

There is a wonderful interest developing in this sugar beet at present. Business men who never expect to raise one, nor to have any stock in a factory, but who understand some of our financial troubles, and intelligent farmers who realize the one sided condition of our production, are looking for information on the subject. All the men to whom samples were sent, and many farmers who bought seed of their own at that time, are again awakening to the fact that we must raise our own sugar. An organization has sprung into being called the American Sugar Growers' Society which has members in many states, and more coming, that has very commendable aims like the following:

To secure for the American farmers, laborers and capitalists the American market for American grown sugar.

To put into the American pocket the one hundred million dollars annually paid to foreigners for sugar, and

To show that the sugar industry may be one of the most beneficent to American agriculture.

Let us push it along. Let us keep our eye on the sugar beet and give it all the support we can.

One who has had experience says, "The beet is an enriching crop, it is the best known forerunner of other crops, it feeds multitudes of stock and instead of impoverishing the soil constantly improves it. The pulp from which the juice is extracted is an excellent food for cattle, the number of which has increased in districts devoted to the industry from eight to ten fold since the introduction of beet sugar making."

Prince Napoleon writing on the sugar beet many years ago, makes it say, "Respect me for I enrich the soil; I fertilize the land which without me would remain uncultivated. I employ men who without me would be idle."

This is too enormous a subject to attempt to cover in one necessarily limited paper, so I have only tried to show the necessity of an interest in it. There is the

character of the beet, its seed, method of planting, of cultivating, harvesting and marketing; the factory, the storing of beets, the profits, national and state encouragement by bounties and otherwise; the method of manufacturing the sugar and many other features connected with it which it is impossible to touch upon now. We will close with a summary of our study of the line talked on. It is—

1st. That the sugar beet will be another product added to our list of farm crops.

2d. That it will be another educator in good farming.

3d. That it will be a soil enricher.

4th. That it will be a crop to lessen the size of our grain field and to give more money to the producer of all other crops.

5th. That it will be a means of more employment at higher prices for our wage earners.

6th. That it will give a feeling of self respect to know we are self-supporting.

THE MAPLE TREE AND ITS PRODUCTS.

By JOHN R. CARTER, Birmingham, O.

[Read at the Farmers' Institute held at Wakeman, Huron county, January 15 and 16, 1897.]

If we commence near the northeastern extremity of the United States and follow a narrow belt from Vermont, through northern and western New York, western Pennsylvania, central and northern Ohio, northern Indiana and southern Michigan we find nearly all the territory where the sugar maple grows in its natural state, and maple sugar is made pure and unadulterated, for the man who boils the sap, as a rule, makes only the pure article. We will acknowledge there are a number of camps in large cities and some smaller towns where a so called maple syrup is made, corn cobs, glucose and a poor article of New Orleans molasses being the chief ingredients. It is then put up in attractive cans or bottles and a large amount of smooth talk is a convincing argument to make a sale.

Vermont would seem to be the only state where a pure article is made, for who ever saw on any bill of fare at restaurant or hotel "Ohio," "New York," or any other brand except "Vermont pure maple syrup."

The beginning of making maple sugar and syrup is far back in the history of the new world, it having been made by the Aborigines, who tapped the trees with a hatchet, caught the sap in a trough made from birch bark, and boiled it in small kettles.

For the benefit of the rising generation, we will tell how our fathers and grandfathers made sugar fifty or seventy-five years ago. The good man of the house started for the woods with his ax on his shoulder, perhaps whistling a merry tune (for there was many a joyous heart in those days) and after selecting a nice, straight whitewood tree, cut it down, divided it into logs about three feet long, split them in halves and from each half dug a trough with a capacity of a pail full or more. For spouts he cut a section about eighteen inches long from a free splitting basswood, split it in slabs about two inches thick and with a concave chisel or tapping gouge, as it was called, split the slabs into thin pieces and sharpened one end to an edge. All was then ready for tapping, which was done when a "sap day" came. The ax was used for cutting the tree and the gouge driven below the incision with a mallet, taken out and the basswood spout driven in its place and the sap caught in the trough. For boiling, two crotches were put in the ground, a pole laid across, and kettles hung from the pole; large logs were laid each side, wood piled around, sap put in the kettles and all was ready for boiling. As the sap boiled away more was

added, and after twelve or fifteen hours of boiling it was syruped down, strained and put away to settle. Of course it was rather dark from ashes, coals, chips, etc., but the maker had an article well suited to the times.

The next stride forward, the kettles were put in a stone arch, the boiling was faster and more foreign matter was kept out. The trough, however, only answered the purpose temporarily, so the sugar maker in looking around for something more durable had a bucket made from pine or butternut, holding nearly two pailfuls, which was very durable. Sheet iron pans next came to the front and no good sugar maker was up to the times if boiling was not done in them, as the sap boiled faster and made a better article. Step by step improvements were made; galvanized iron pans being used instead of cast iron; wooden pails taking the place of the old fashioned buckets, and instead of the ax the auger was used for tapping the tree; the concave spout was thrown away and a round one, made of elder or pine, was used and we were highly pleased with all these improvements and thought the summit had been reached in sugar and syrup making.

But the genuine Yankee is never satisfied. Onward and upward is his motto and perfection in syrup making had not yet been reached, so inventive genius brought forth the evaporator made of tin, put on a sheet iron arch with doors to keep out all the troublesome ashes, coals, etc.; the tin sap spout, tin pail with cover, and other minor improvements superseded the wooden utensils. Having seen the evaporator advertised in a farm paper I wrote to a firm in Garrettsville for a description of their goods. Instead of an answer by mail, an agent rapped at our door about seven o'clock one evening, made himself known and was cordially received. After a short conversation he began to show the superior qualities of his goods, and fine samples of sugar and syrup made by this evaporator; sugar white as granulated cane sugar and syrup clear as crystal. It was too much to believe. I was a doubting Thomas, had not seen the process and could not believe it to be true. To cap the climax he showed me a little tin sap spout about three inches long to be driven in a three-eighths inch hole made for a pail to be hung on it until full of sap. "That," I told him, "was too much. A little spout like that to hold a pail of sap! It can't do it." "Why," he said, "it will hold you if you will keep still." I never knew whether he meant my tongue or my body. Well, we talked until late in the evening and after he retired my good wife said, "John, you are not going to be fool enough to pay ninety-five dollars for one of those things, are you?" "I can't tell, I have done a great many foolish things in my life, and this may be one of them." After thinking the matter over I concluded if he would guarantee that the evaporator would boil away two and one-half barrels of sap per hour I would try one. The sale was made, new tin spouts purchased, loops were put on the pails and we started with bright hopes and expectations, and when, after the first days' boiling, we came to the house no little boy with his first boots was prouder than I. But trouble was in store, for when I went to deliver my syrup the customers looked at it with suspicion and said: "We can buy granulated sugar cheaper, and melt it ourselves." This set me to wondering if I would have to go back to the old process in order to sell my syrup. No, I could not do it. The evaporator boiled faster and made a better article and I determined to use it and educate the people up to it, and for old fogies to have a special boiling, and mix in a few leaves, coals, etc., to suit their tastes.

We learn fast, however, and have discovered that sap is purer and clearer than water; then why not make an article nearly transparent? Cleanliness and dispatch are the essentials to make a fine quality of syrup. Commence boiling as soon as the pails are one-third full if you can. Strain the sap through cheese cloth, boil shallow in the pans, say about one inch deep, strain the syrup as it comes from the evaporator through thin white flannel; put in a can to settle for twenty-four hours, then run off carefully in a pan made of heavy tin from six to ten inches high, and

two, or two and one-half feet square; put it on your stove in the house or sugar house, cleanse with sweet milk and eggs and when it commences to boil, skim thoroughly; when boiled to the proper thickness remove from stove and can it. The size of the can will depend upon what your customers want. I have used mostly gallon cans but now find the trade is wanting smaller sizes, and we shall have to furnish them, or some other manufacturer will. Some prefer to can the syrup when cold. I have always canned it while hot with success.

Thirty years ago the trade was mostly in sugar and only a limited amount of syrup was made, and that from sap that had rainwater or snow in it, or that was the last run of the season. Consequently a dark syrup was made which led the people to believe that maple syrup *must* be dark.

As to marketing, when you get a good customer *keep him*. Give him your best make of the season. If you do not have it, buy it of some one who makes a good article and then examine it closely to see if it is a first-class article, for if you once lose a customer you can scarcely ever secure him again. I have customers who have bought syrup of me for twenty years or more, and who take nearly a hundred gallons yearly, and I lost one who took the same amount, by not being careful enough in buying. Send your dark colored syrup to a commission house in some city and let it be sold on its merits, and you will be a gainer in the end. One of our great political parties had protection inscribed on its banner during the campaign. That is what maple syrup makers should have for their battle cry. The country is flooded with a spurious article put up with attractive labels to deceive the buyer. Let us form one solid phalanx and drive these destroyers of honest labor from among us.

ADVANTAGES OF ROTATION UPON THE FARM.

By WILLIAM A. BEARD.

[Read at the Farmers' Institute held at Shandon, Butler county, February 8 and 9, 1897.]

Having practiced a certain rotation of crops for some years, it is my pleasure to-day to tell you of some of the advantages of the system as seen from my point of view, and I know of no better way to illustrate than to tell my own personal experience.

We raise three crops per year, corn, wheat and clover. We have our tillable land so plotted that we can practice the three-year rotation, that is, we have at one time, say June 1, '97, one-third of the tillable land in corn, one-third in wheat, and one-third in clover.

One of the first advantages of the three-year rotation is in the economy of labor; for example, we keep two hired men, who board themselves, for nine months of the year. They work during good weather in March. In that month we have clover seed to sow, ditching and laying of tile, wood to haul, fence to build, general repairing, and possibly some spring plowing; in April, plowing for corn; in May, harrowing, planting and cultivating corn; in June, cultivating corn; the early part of July, wheat harvest and threshing, and the latter part of July and August finds us in our clover. We raise the Mammoth clover so it will not conflict with cultivating the corn or the harvesting of the wheat, maturing as it does at a later date than the small red clover. I will speak more fully of the clover crop later on. September and October find us cutting fodder and sowing wheat, while November and early December find our corn in the crib. This is rather an elaborate description, but I know no better way of bringing the details before this audience than this

full explanation. Our central idea by this rotative plan is to employ steady labor and have steady work for that laborer to do.

Remember, these two men care for ninety acres of corn, ninety acres of wheat and ninety acres of clover, but bear in mind there is only one breaking of the sod to do in the three crops. Breaking sod is the most costly work we have to do on the farm. Some one possibly will say, "Two men cannot plow ninety acres in the spring before planting." You know that two men with two good three-horse plows will turn a quantity of sod in five weeks' plowing; it is the steady work that counts. In the preparation of the seed bed, planting and cultivating of the corn crop we economize labor by the use of the improved harrows, planters and cultivators, so that July 4th generally finds our corn laid by; then we glide right over into the ripening wheat fields, and it is wonderful, in this progressive age in which we are living, what two men with an improved self-binder and bundle carrier can do in eight days in the harvest fields. We hire very little extra labor through the threshing season as we have a threshing pool wherein we neighbors change threshing, so that labor is economized. And again it is wonderful when we stop, think and compare with twenty years ago, what two men with self-feeders, automatic weighers and cyclone stackers, can accomplish in one week in the threshing season.

Right here would be a fine place for a little discussion on political economy and the radical changes that are taking place in every department of labor through the power of machinery. We are making history faster than it was ever made before, and as to when we will reach the climax of this machinery-making age we can only conjecture, but we do believe that the historian will write that the period from 1870 to 1900 was the most fruitful in inventive genius this world ever saw. When we compare the sickle and the flail with our self-binder and cyclone stacker, when we compare the hoe with our corn planter, when we compare the broadcasting of wheat with our improved wheat drills, when we compare our smooth highways of to-day with the by-paths of the past, we are almost moved to laughter, and we call our grandparents back numbers. But now if this inventive genius is not thwarted in the near future, the question confronts us in comparing ourselves with our grandparents of 1830 to 1840, how will we compare with our grandchildren of 1930 to 1940.

However much I would like to discuss the march of progress, I must keep in line with my subject. It is useless for me to explain how these two men cut and thresh the mammoth clover, how they seed the wheat and cut the corn, but the idea I wish to impress is this, to have my work so arranged by this rotative plan that by the aid of modern machinery I can harvest the greatest amount with the smallest amount of hand labor.

Another advantage is that by our rotative plan we have clover sod every year for corn which, as you all know, is the most easily prepared seed bed we have. You are not bothered with the pest of weeds if you give your corn the proper attention, and clover sod will hold more moisture throughout the summer season than almost any other seed bed.

Another advantage of our rotation—and possibly the greatest of all as we see it—is that with the amount of manure that we cause to be made and spread on our thinnest soils each year, and the clover roots, haulm and aftermath that we turn under each spring for the making of humus to feed the future crops, we think and believe through experience, that we are not robbing our soil but possibly gaining a little in fertility each year. We feed every bushel of corn we raise, so that we fertilize from fifteen to twenty acres of our thinnest soils each year.

We make but very little clover hay, only enough for our horses and milch cows; we raise no timothy. Our great dependence for rough feed for our cattle is corn fodder which we think, considering labor, fertility and our rotative plan is the

cheapest rough feed we can secure. I have no doubt there are a great many here who will take issue with me, but this is as I see it.

I have not the time to tell how we handle the corn fodder as I fear my article is already too long.

Another advantage of our rotative plan is, that we have not so many irons in the fire at one time, but that all our efforts are directed to the three crops, corn wheat and clover, and we have them so arranged that, by using the mammoth clover, each crop is out of the way of the others and they do not conflict.

I expect the question will come up, what work do I do in this rotative plan? Well, I will tell you. I am feed boy, errand boy and general helper. We have hogs or cattle feeding the year round, we get all our wheat straw and fodder into fertilizer each year. I have to buy and sell all the cattle and hogs we feed. We generally put up temporary fence and feed hogs throughout the summer season on the thinnest part of the clover field. When there comes a wet season and we are kept out of our corn field for a week or ten days, it needs a fellow about my size to take an extra team and cultivator and help the boys for a few days in plowing corn; the same is true in wheat harvest, threshing and seeding. I must add that there are a great many things I do not do which I ought to do around the old place by way of repairing doors, gates, etc.; at least you probably would think so if you should drive by my place, but I am not a thoroughbred in that kind of work, being, what you would call, very unhandy in the use of tools.

Now I have shown you our rotative plan. We have studied our situation, soil and location, and we believe this is the best plan or system for us to pursue.

In closing I wish to forcibly bring this point before the audience, that there is no need of the boys becoming discouraged on the farm, that the old farm can be made a machine of itself; a factory *per se*; a plant if you would have it, whereby under this rotative plan, we virtually create commodities, and manufacture them from the rough into packages of smaller volume with a higher commercial value. Where is the machine, factory or plant that can do more? Best of all, there is no wear out to this old plant or factory. What other machine can do so well? Other machines have their limit of wear; friction makes them all short-lived.

I must add that I candidly believe there is a better chance for the intelligent young man on the farm to-day, running that farm under a system, and incorporating business principles in that system, than almost any business I know. If you think not, go out and try to invest five thousand dollars in cash upon the open market; inspect and inquire into the prices of bonds, stocks, mortgages and lands and after you calculate premiums, risks and possibility of court expenses, I think you will be forced to conclude that land at its present value or selling price is as safe an investment as you will find in your search.

FEEDING THE PRODUCTS OF THE FARM.

^cBy M. B. LAYTON, Dupont, O.

[Read at the Farmers' Institute held at Continental, Putnam County, January 29 and 30, 1897.]

Some one has said that in order to get the best returns from the farm, its entire product should be fed to stock. This I believe to be the case at the present time, whether it will always hold good or not.

The present market values of our products are so small, that three-cent hogs, four-cent cattle and four-cent sheep will consume them at a considerable gain over the market quotations.

Many others, undoubtedly, agree with me in this, for I have observed that as prices go lower, more of the products are consumed at home; showing that it is intended to realize more from them than they would bring in the market; or, in other words, evidencing the belief that it pays to feed. My reasons for believing that it pays to feed I shall endeavor to show you as we go along.

If we are convinced, then, that it pays to feed at all, the next question to consider is the quality of stock we should feed.

It is said that Bakewell, a noted live-stock breeder, after years of experience, declared that "animals are like wax, and in the hands of the breeder can be fashioned to suit his tastes." To those who have had experience in breeding, this seems really true; for the pioneer cow has given place to her more respected successor, the shorthorn; the shorthorn, in turn, is being fashioned into harmless breeds. The wild hog of the forests has yielded to the improved breeds of Poland Chinas, Chester Whites and Berkshires; the half bare sheep now takes its place with Indian hogs and brindle cows, while in their places we see the ideal breeds of the present day. What, then, should be the kind of stock to which the products of our farms are to be fed? Should it be the old time cattle, or should it be the improved breeds of good shape and growth? Should it be the wild hog of the forests or the celebrated breeds before mentioned? Should it be the half-wooled sheep or his well bred successor?

In each case I think we will agree that the latter should be the choice of every feeder. Why? Because, in the first place, the low grade stock does not properly fatten. It is a well known fact that the sooner your stock is ready for market, the more profitable it is; that is, the earlier the age at which it be made to mature, the greater the profit in feeding.

With our improved breeds we have that symmetry of form which enables us to reach a standard weight at a much earlier period and with much less feed than will the rough made stock. Let me say here, however, that well-bred, graded stock is at no great discount; for in the opinion of many feeders, they are just as good to fatten and have proven themselves to be a more sturdy stock as they do not so easily fall a prey to disease. Just where to draw the line between thoroughbred and graded stock must be determined by the judgment of the feeder, and there are various points to be considered in connection with this.

Of course there are exceptions to those improved breeds which I have mentioned, as we have some well-bred dairy cows, the least bit of whose blood seen in the feeding stock, would condemn it. We also have certain breeds of sheep which have been very valuable as wool growers but not so well adapted to feeding. Our next reason for avoiding poor quality is that they are not so good sellers as our well proportioned herds; and our third reason is that they are much less pleasing to the eye.

How ready we are, if we know that we have nice, trim stock, to invite our neighbors to come and see it. What pride we take in showing it; and how gratifying it is to have them compliment us on our possessions. But how is it with those inferior grades? Have we any particular anxiety for our neighbors to see them? Ah! no, we don't care about advertising them; but we keep them behind the barn out of the view of passers by. There is more in this last reason than at first appears; for the satisfaction one has of knowing that he has what attracts and pleases others, as well as himself, has much to do with his ambition and his progress and consequently with the advancement of the world; for with ambitious and progressive individuals we have a progressive country.

So much for the quality. And after considering this, the question arises as to what kind of stock pays best; whether it be cattle, horses, sheep or hogs. This depends largely upon the prices at which the respective kinds may be placed in the feed lots and the future prospect of the market at the time when we expect to have

them ready to sell. It also depends, partially, upon the facilities of the feeder, as he is often better prepared to feed one kind of stock than another. He may have an abundance of corn, with little or no hay, and unless the latter be cheap, it would be well that the hog be made the principal consumer. I take it for granted that the owner of the corn has cows and horses which must be fed the fodder; or, he may have plenty of hay and good straw and but little corn, when other stock should be fed. If corn is dear he may feed young stock that he does not wish to prepare for the market, and may substitute other articles in its place or feed them along with it. If one has plenty of clover hay and enough corn, he will find that a flock of lambs or a load of cattle will be splendid property to consume those products.

If we are our own producers of the stock we feed, we may by proper breeding, have the kind desired, but where we depend on others, we often find it difficult to get the desired kind, and are almost always compelled to take some of inferior quality in order to get the good ones also.

Such cattle are always a hindrance to the sale of the herd and should be made ready for beef at the earliest possible date and disposed of to butchers, or otherwise, and their places should be filled with better ones. I refer, now, to the feeding of car load lots, for when this can be done, I believe it better to feed that number than to feed less. Eighteen or twenty good, well-fattened cattle at two years old will fill a car and, if we do not intend to ship them ourselves, we will find it much easier to sell them than if we have but part of a load, as the buyer has no fear that he will be unable to fill his load when he wishes to ship. It also places the feeder in such a position that he may charter a car and ship them himself if he does not feel disposed to take the prices offered by the shippers. This may prove good policy and it may not; but one thing is sure, several trials of it will teach us what it costs, and we will be better posted in regard to this, and, perhaps, better men to deal with thereafter.

Many of our farmers who handle car load herds, go to the market places to purchase them, generally to Chicago from this vicinity. It is often the case that they can be bought cheaper there than they can be picked up in the country, for it has become the practice of the majority of our farmers to sell their calves for veal, and hence, the man who travels our highways in search of cattle, finds them few and far between; and, I am sorry to add, that those few are mostly unfit for feeding. With the existence of this state of affairs, I wish to call your attention to the fact—if you will pardon me for deviating from my subject a little—that we are driving money out of our community that ought to be used in it; and consequently are injuring the business and prosperity of our own locality. To obviate this we should breed well, then save calves for feeding. They will be much preferred to those bought in our market places and will be readily picked up by those who desire to feed.

It is a question in the minds of many, as to whether it pays to keep calves to the age of one year, or older, when they can be disposed of at the present prices they bring when eight or ten weeks old. It is a question, too, that I am unable to answer satisfactorily, but my opinion of the matter is, that after the calves have passed the age for veal, they will not be worth any more per pound than they will at the age of one year, perhaps less, and veal calves sell at from five to eight dollars per head.

With a fair quality of stock the yearling may be made to weigh six hundred pounds. To verify this statement, I will simply mention that a friend and neighbor recently butchered a fourteen-months-old heifer that dressed four hundred and fifteen pounds. Considering that it would dress away half, its live weight would have been eight hundred and thirty pounds. The owner informs me that it had been given no special care as he had not intended to kill it; hence, at three cents per pound, the yearling would bring eighteen dollars, leaving from ten to thirteen

dollars for rearing from the veal age to that of one year, or for keeping from seven to nine months. Now, I do not know what it really is worth to keep a calf to that age; but judging from what it has cost me per head to feed my two-year-old cattle, when giving them all they would eat, I freely say that I believe it would be feed well sold.

I find by computation, that my grown cattle are **debtor**, per head, for five months' keeping, to the following:

Corn, 44 bushels @ 25c per bushel.....	\$11 00
Fodder, 11 shocks @ 8c per shock	88
Hay, 1-10 of a ton, second growth, @ \$5 per ton	50
Pasture, 1½ months @ \$1 per month.	1 50
International Stock Food, per head, 13c.....	13
Total.....	<hr/> \$14 01

This estimate is for cattle that will be three years old in the spring and that were being crowded for the market; and you will observe that I have figured feed at a fair price; some of it considerably above what it is worth in the market. I have reason to believe that the calf could be kept the stated time—seven to nine months—at much less expense, for it could not consume that amount of feed. We know that milk is an important factor in the young calf's feed, and in order to make a good veal he must have an abundant supply of that article, fresh from the cow; if not, he will go as a "skimmer," and at a reduced price. This is the most expensive part of his feed, and if the amount necessary to feed him till the age of two or three months can be furnished for from five to eight dollars, I feel sure that he can be kept the remainder of the year for ten or twelve dollars.

I might say here, also, that I have lately been entertaining the thought that there is even more money in raising cattle to the age of two years than there is in feeding older cattle. At two years old they may be made to weigh one thousand pounds—bear in mind that we desire good quality at all times. This weight cannot be doubled in two years more, though the animal will consume much more feed.

With the difference in prices between cattle for feeding and fat cattle, ranging so closely as they did last fall, I am inclined to believe that the stockers would pay best. However, I am anxious to hear from others in regard to these points. If it can be proven that calves can be profitably held until they become yearlings, we might bring about a state of affairs quite different from that which now exists.

Much of the produce of our farms might be fed to cattle that is now fed to hogs, without injuring the market for the former and at the same time stimulate that for the latter, while it would enable the purchaser of feeding stock to buy them at home, keeping his money in his own community.

I read in my paper that "neat, level, well shaped and fine boned cattle were the kind sought at our Christmas market, while others were neglected." I would say to you, seek a like quality for the feed lot. Don't stock the place with Jersey cows and expect to feed their calves the products of your farm.

We might place next to this, the necessity of dehorning, as that seems to have become one of the prime requisites in preparing cattle for the feed lot. The cattle, after being deprived of their ornaments, assume a more peaceable disposition, and may be much more conveniently fed and housed and at less expense, as they will huddle together like so many sheep. I cannot, however, refrain from saying that I think dehorning a disadvantage in some respects; for experience has taught me that hornless cattle are harder on fences than those with horns, for they will crowd along the fence and rub it down, while horned cattle do not crowd together and hence do not throw so much weight against the fence. Hornless cattle also crowd

together when driving and if the weather is warm, do not stand the heat as well as if kept a little apart. Then, again, when on pasture they stand huddled in a bunch, fighting flies during the day while the weather is hot and do not graze as much as others, but for the feed lot, I prefer them dehorned.

After determining these points we will consider the methods of feeding. If we begin with calves they should be taught to eat a little grain as early in the fall as possible. Oats is a good feed to start them on and later it may be mixed with shelled corn; a little bran added to these makes a splendid ration, and together with hay, (clover if possible) or corn fodder, will bring them out nice and plump in the spring, ready to graze. Chop feed is also an excellent feed for calves if not fed to excess. Some may think it unnecessary to feed a grain ration to calves or to cattle not being fed for that season's market. For the benefit of those persons, I will give, not my own experience, but that of two neighbors, which I have been told they had a few years since. Each purchased in the fall a herd of spring calves. Both furnished sheds in which the calves might seek shelter at will. Both also allowed the calves to run on grass until late in November, when they commenced feeding; one feeding nothing but corn fodder and the other giving, in addition to this, a daily ration of chop feed—about three quarts to a head per day.

When spring came and the calves were turned out to grass, the grain fed herd was apparently no better than the other, and the two parties felt convinced that the chop fed to the one herd was lost, but ere long the benefits of the chop became manifest. Those calves proved much more thrifty than the others, and by the second fall were more than two hundred pounds heavier than the ones which had been "roughed" through the previous winter. Each then concluded that it paid to feed grain, a thing in which I too am a firm believer, and I shall be glad to see the day passed when people believe in "roughing" their stock through the winter.

If older cattle are desired, the time to begin feeding will depend upon the condition of the pasture and the time you wish to have your cattle ready for market. As to the kind of feed, corn, as we all know, should be their principal ration, no matter what form we feed it in. For rough feed clover hay stands first in my judgment, with corn fodder in close succession. Timothy hay or nice, bright straw will be readily eaten if brined occasionally, but the latter should not be depended upon in preparing feed. The manner in which the corn should be fed is not agreed upon, some claiming that it should be fed in the shock, others that it should be husked and chopped, and still others that it should be ground. That is a question that I am unable to settle, but so far as my experience goes, I am led to believe that if one begins feeding early in the fall when he has his seeding to do, his clover seed to take care of and corn to husk, he would do well to feed it in the shock unless the ears be too large for the animal to crush conveniently; for the extra profit from feeding in other forms may hardly be sufficient to justify him in taking the time to prepare them, when he has an abundance of other work that must be done. But if other work be not too pressing I believe it will pay to husk and grind into corn and cob meal.

When feeding in the shock, the corn may be hauled out on the pasture and scattered over the grass, thus distributing the fertilizing qualities as we feed it. One objection to this is, that while we are distributing the fertilizer as we feed it, it is seldom putting it where we would most desire to have it; another disadvantage in feeding shock corn is that much of the food value of the fodder is lost. In feeding for the market one must throw out corn lavishly; and the loss of fodder will be fully two-thirds of the amount fed unless the cattle be confined in close quarters where no other feed can be had; even then the loss will be quite noticeable. Still another objection to shock or ear corn is that the cattle do not properly masticate it, and, therefore, do not digest it.

It is needless to state here that an animal's development depends not so much upon the amount he eats as it does upon the amount he digests, and if we can aid

his digestive organs in their functions by grinding the feed we have that much gain. Whether that gain is sufficient to pay one for the work necessary to prepare the feed is a question which is, as yet, unsettled in the minds of many; but my experience has led me to believe that you will be amply rewarded for that labor, if your other duties do not demand too much of your time. No matter how busy you are, if your corn is husked it will pay to grind it.

Below I give the result of my own experiment during the past five months:

I placed in pasture, August 17, eighteen head of two-year old cattle weighing nine hundred and twenty pounds each. With these I placed one yearling, weighing seven hundred and thirty pounds, making the average weight of the herd nine hundred and ten pounds. When I commenced feeding, one month later, their average weight was about nine hundred and forty-five pounds. I fed shock corn eighty days, during which time they consumed five hundred bushels, or six and one-fourth bushels per day. At the end of eighty days, December 5, they weighed one thousand, one hundred and sixteen pounds.

Gain per head, one hundred and seventy-one pounds.

Gain on nineteen head, three thousand, two hundred and forty-nine pounds.

Gain per day, per head, two and one-eighth pounds.

Gain per bushel of corn fed, six and one-half pounds, nearly.

I then commenced feeding corn and cob meal and after seven days I weighed again and they averaged one thousand, one hundred and thirty-eight pounds, a gain of twenty-two pounds per head in one week. During this time I also fed a little "stock food," by sprinkling it over the feed in the troughs. In this time I fed eighty-two and one-half bushels of ground feed, equal to thirty-six bushels in the ear.

Gain per day on each head, three and one-seventh pounds.

Gain per bushel corn fed, eleven and one-half pounds.

Excess in gain per bushel of corn fed when ground, over that fed in shock, five pounds.

Two weeks later, December 26, I weighed again and they averaged one thousand, one hundred and fifty-eight pounds.

Gain in fourteen days, twenty pounds per head.

Gain in fourteen days on nineteen head, three hundred and eighty pounds.

Ground feed fed was equivalent to sixty bushels ear corn.

Gain per day on each head, one and three-sevenths pounds.

Gain per bushel of ear corn consumed, six and one-third pounds.

The cattle were then confined in a small lot and fed just one month when they were weighed to the shipper, having been sold two weeks previously.

On this date, January 26, 1897, they averaged one thousand, two hundred and fifty pounds.

Gain in thirty days, ninety-two pounds per head.

Gain in thirty days on nineteen head, one thousand, seven hundred and forty-eight pounds.

Ground feed fed was equal to two hundred and forty-five and one-third bushels of ear corn.

Gain per day on each head, three and one-fifteenth pounds.

Gain per bushel ear corn consumed, seven and one-eighth pounds.

By taking the average gain per bushel of corn fed in these three periods, we find that the general average is eight and one-third pounds of beef to every bushel of corn fed when ground. We find above that the gain per bushel of shock corn was six and one-half pounds, therefore, the excess in gain of ground feed over unground is one and five-sixths pounds.

These cattle were sold at four cents per pound, hence, we received seven and one-third cents per bushel more for the corn that was ground than for that which

was unground. They consumed in all forms eight hundred and forty-two bushels of corn, which at the rate of these tests would have paid me sixty-one dollars and seventy-four cents more if ground than if unground. The fodder saved by husking the corn would have paid for that work, and the sixty-one dollars and seventy-four cents would have represented my pay for grinding the eight hundred and forty-two bushels of corn, which figures out seven and one-third cents per bushel. By actual experience I have found that it can be done for less than half this amount, hence, on every bushel I should clear about four cents. This test also shows that the average gain per month on shock corn was sixty-four and one-eighth pounds, while the monthly gain on ground feed was eighty and two-fifths pounds, or sixteen and one-fourth pounds more than on unground.

Let us notice here, too, that the shock corn was fed when the weather was moderate, and when the cattle also had grass, and the meal was fed during the severest weather we had, when more feed was required to keep up the animal heat. Figuring the fodder at eight cents per shock, the second growth hay at five dollars per ton, pasture at one dollar per month and the "stock food" at its actual cost, I still have left for my corn thirty-eight cents per bushel. In addition to this I have at least thirty or thirty-five dollars' worth of fertilizer and about eleven hundred pounds of pork, and might have had more of the latter had I the pigs to turn in.

This experiment has proven to me that it pays to feed and also that it pays better to feed ground feed than unground. By chemical analysis it is shown that 41.52 per cent. of the cob is of nutritive value, and that it contains the same form of nutritive matter as is found in a large percentage of our best grains, and nothing whatever of an injurious nature. Therefore, it is worthy of consideration as feed and not only for the nutriment it contains, but I believe it is an aid to digestion, as the meal gathering on the little particles of cob is kept from balling in the stomach, and it also gives the digestive fluids a better chance to work on it.

When feeding ground feed or husked corn it should be fed in troughs which should be made at least two feet wide and five or six inches deep, to prevent the cattle from wasting the feed by dropping it out on the opposite side of the trough. These should be cleaned each time before feeding if anything is left in them. When on full feed the cattle should be confined in a reasonably close lot, with an abundant supply of good water and all the feed they will eat. If convenient to do so, stack your straw in the lot where they may have access to it, and if possible have a good shed wherein they may seek shelter in stormy weather and at night; but I would not advise you to build a barn for this purpose, if it has to be done on borrowed money, although some do give that advice. I have never used a self feeder, but the benefits of such a structure are perceptible to the habitual feeder.

Having gotten the cattle ready for market, another important factor of success is their proper disposal. Keep posted on the market and watch your chance. Sheep feeding may be made a profitable business if carefully attended to. Sheep are more delicate than other stock, however, and should be handled with especial care, but since this society has already devoted considerable time to the discussion of sheep husbandry, and also to that of hog raising, I will not tire you with further discussion of either, and will I leave the horse problem for more experienced men to solve.

THE USE OF THE SILO.

By JOBE HODSON, Montpelier, O.

[Read at the Farmers' Institute held at Montpelier, Williams County, November 30 and December 1, 1896.]

The present age beyond all others has been one of development and progress, and the successful farmer of the future must ever be on the alert to avail himself of

improved methods. Invention, progress and improvement are simply the means and processes of lessening the cost. Among the many of the modern useful methods or inventions that have come to aid the stock raiser, is the silo. Now the requisites of a silo are simply air tight walls, which may be made of various materials and shapes, and the materials and shape best to use will largely depend upon location and relative cost of materials. To the farmer who has the timber, the wooden silo is the one to build; and, if he is as familiar with the saw and hammer as every farmer should be, he can do the work himself—that is, if his time is not worth more at something else. We will assume that he already has a barn and that as commonly constructed, it contains at least two mows or bays. The end of one of those mows is a good place to build the silo in, the one that is the more convenient to the stable. This he will have to determine for himself according to barn and stable arrangement. The size of silo to build, will, of course, depend upon the number of cattle to feed. I deem it profitable to feed from six and a half to seven months continuously, commencing sometime in October and feeding into May. If he has cows it is well to have a surplus to feed in case of early drouth as in the years of 1894 and 1895. We will suppose that he has fifteen head, old and young, or the equivalent of twelve head of one thousand pound animals. Forty pounds per day, fed in two feeds, is a good sized ration, with the addition of grain according to the kind and purpose for which they are fed, and hay, fodder or straw. In seven months there are two hundred and ten days, multiply this by forty and we have eight thousand and four hundred pounds, equal to four and one-fifth tons required for each animal; multiply this by twelve and we have fifty tons for twelve head of one thousand pound cattle.

Now, as in all bulky feeds, we must allow something for waste, say 20 per cent. which will make a sixty ton silo.

It has been found by measurement and weight that a cubic foot of silage weighs from forty to fifty pounds; we will say forty pounds, to be on the safe side; then it will take fifty cubic feet of space for a ton; multiply this by sixty and we have three thousand cubic feet required in the silo. The depth will be determined by height of the barn, but make it as deep as you can—twenty-five or twenty-six feet—and greater depth will be better if the silo starts from the basement. We will say that the barn has eighteen-foot posts, as this is a very common height, and stands two feet above ground, this will give us twenty feet in depth. Dividing three thousand cubic feet by twenty gives one hundred and fifty square feet as the area of the silo from which the length and breadth can be easily obtained. The details of construction and building I will not attempt to give, as it would require too much time, but will give an estimate of about the amount of material and cost of a silo of the above dimensions:—Fifteen thousand feet of 2x8 scantling, beach, rock elm, sycamore or any hard wood; two thousand feet of seven-eighths inch boards, planed on one side, same lumber as above; one roll of tarred paper. Three thousand, five hundred feet of lumber at eight dollars per thousand, makes twenty-eight dollars; for planing, two dollars; tarred paper and nails, five dollars; three thousand brick for foundation, sixteen dollars; fifteen days' work at one dollar and twenty-five cents per day, eighteen dollars and seventy-five cents; total cost of silo, sixty-nine dollars and seventy-five cents. Actual capacity, seventy-two tons, less one-sixth for settling. The larger the silo the less the cost will be in proportion to capacity.

As I said in the beginning, any farmer ought to be able to do this work himself if he has time, and of course he should be able to furnish the lumber; this would take off forty-five dollars, or leave but twenty-five dollars for a cash outlay. And in many localities stone can be used in the place of brick at a much less cost, or a sill could be laid on the ground and double boarded between this and barn sill, the same as above, and thereby reduce the cost to the minimum, but of course, this would not be so durable and I would not advise it on that account. I think that

I have given you in the foregoing a sufficient idea of construction and cost, and the next question is, with what shall we fill it, the cost being always the main factor to be kept in mind relative to the value. Although various individuals as well as experiment stations have demonstrated that all kinds of crops can be kept in a silo, yet corn on account of the much greater feeding value, and because a greater quantity can be raised on a given area, is the one crop to raise in this country at least.

An ordinarily good piece of land rightly planted to any of the large varieties and well cultivated, will produce ten tons per acre, John Gould says fifteen tons, and I am satisfied that I have seen more than that even, to an acre. Five acres will produce the fifty tons required for the twelve head of cattle for seven months' feeding. Now, the five acres can be put in the silo in one day with any of the large size ensilage cutters, provided that the machinery is all in place the night before, and you have a gang of nine or ten willing men, and two boys to drive the two teams. Allowing the men one dollar and fifty cents per day, and allowing the boys one dollar each, makes seventeen dollars; the engineer and engine will cost three dollars; ensilage cutter, two dollars; wood for engine, one dollar; and two teams and wagons two dollars; total twenty-five dollars, or fifty cents per ton. By changing work with your neighbors you will only have the engine and cutter to pay for, allowing that you own neither. The cost of growing a crop of corn each can determine for himself, but you will find that at the same rate, one dollar and fifty cents per day for man or team, it will cost about the same as the harvesting of it. Then if you allow five dollars per acre for rent of land you will have a total cost of fifteen dollars per acre, or one dollar and fifty cents per ton of ensilage. We will now try and get at the comparative value of this five acres of silage with five acres of field corn. We will allow forty bushels of shelled corn per acre and my experience is that it is as easy to grow ten tons of silage per acre as forty bushels of shelled corn. The cost of putting the field corn in shock, husking and storing corn and fodder, will be nearly as much as the ensilage. But if you take the corn off the ground so as to put in a wheat crop, the labor will be greater; and right here I want to say that one of the nice things about an ensilage crop is, that it is always off the field in time for wheat sowing, and every wheat grower knows that such a field is the best we have for wheat. Five acres at forty bushels per acre will give us two hundred bushels of corn; this is a little less than one bushel per day for the twelve head, or two and two-thirds quarts each per day. But a good feeder will be likely to have it ground, as a forty bushel per acre crop will have large ears. This will reduce the ration to two and one-half quarts per day each, after taking out toll. Then there will be the corn fodder in addition, of which it is hard to estimate the value, as so much depends upon the season. But we will allow forty-five, "sixty-four-hill shocks" to the acre and suppose them tied into four bundles each, which will give us nine hundred bundles to feed the twelve head of cattle two hundred and ten days, or four and one-fourth bundles per day for the twelve head, or one-third of a bundle for each head per day, with the addition of the two and one-half quarts of meal. It will need about six times that amount of fodder or two bundles per day each, will it not, besides hay and other grain to make a balanced ration? I am not contending that the silage is a complete ration of itself and that you will not need the addition of other feeds with the dry feed, although I know of a man who wintered some eighteen or twenty head—mostly cows in milk—on silage, with the addition of a little oat straw, and the silage was of a very poor quality, having been frostbitten some days before pitting; in fact, one would hardly have thought it worth putting in shock, as it was a large southern variety and immature; and he said that the saving and gain in that one crop had paid him for the building of the silo.

The Kansas Experiment Station grew one hundred tons on ten acres and sustained twenty-five head of cattle one hundred and ninety-two days; this was only a

little over twenty pounds per day or one-half of what I allowed. What I contend for is, that the same amount of land and labor will produce about twice the amount of feed stuff when put in a silo as by the ordinary dry feed method, besides much less risk of loss from rains and bad weather. In fact, with the silo it makes little difference what the weather is, except for the convenience of working, whereas the value of a cured crop largely depends on favorable weather. Witness the condition of the corn, or the corn fodder at the present time. The Experiment Stations tell us that loss in curing fodder is never less the 20 per cent., and in such seasons as the present it n doubt is nearer 60 per cent., while the Wisconsin station preserves silage at a loss of only 8 per cent. of feeding value. But very likely some one is ready to say, "You want to plant a small, early variety of corn and plant it thick so that the fodder will be fine, with small ears; then cut it as quickly as it matures and store it in barns without husking, and you will save much of the labor." This may be true as regards the labor part, but how would you have cured it the present season at the time of ripening, about the middle of August? The fodder would have been much spoiled and probably the corn moulded, so that the feeding value would have been much reduced; besides, small varieties of corn will not produce nearly the amount of either corn or fodder as mentioned in the above estimates; so I think that you would be saving your labor at the expense of a part of your crop.

Now we will consider silage as adapted to the various kinds of stock. First, it is preeminently the best bulky food for milk cows, as it furnishes far more largely than anything else, at anywhere near the same cost, that succulent food so necessary to milk production, and health to animals kept in a warm stable the most of the time, as they must be for profitable feeding. Sugar beets and mangel wurzels come the nearest to it, but silage produced more milk at the Ohio Experiment Station, more butter at the Pennsylvania Experiment Station, and more mutton at the Michigan Station than beets, and beets are better than mangel wurzels.

Second. Silage is equally good for young, growing cattle; even calves will take to it when quite young. The smell and warmth of it seems to be appetizing in cold weather. For fattening cattle, I have had no experience with it, but from reports from Experiment Stations and individual feeders, it comes highly recommended when not fed in too large quantities.

Third. Horses, hogs and chickens all relish it; although I would not recommend building a silo primarily for these, yet, having one, I think it healthful to give them a small feed occasionally; they seem to relish it and take to it readily. That you may have an idea of what can be done, my neighbor wintered his horses nearly entirely on silage without any evil results and worked some of them a large part of the time. For hogs it certainly is an excellent food, especially for young shoats and brood sows. They will eat it nearly all and relish it and I think that an occasional mess thrown to the fattening hogs, that are mostly fed on corn, is very beneficial. For chickens, yes, wife says that I must not forget the chickens, she says that she wonders how she ever got along without it; well, we got along with very few eggs in the winter time, that is the how of it. Now, I don't want you to infer that the silage is the sole cause of increased egg production, but by some coincidence, better care, housing and silage came about the same time. Sheep is the only kind of stock that does not take to it readily, or appear to like it. There is something in the fermented smell and acid taste that they don't relish and, as in normal conditions, nature furnishes the best guide, I question whether it would be healthful for them, were they by any means induced to eat it. It may be that I am in error in this conclusion, as I never fed it long enough to really know what would be the result.

Since we have gone over considerable ground at some length, it might be well to summarize the facts that we have presented, that they may be the more easily remembered.

First, the cost of a wooden silo with double sealed walls, tarred paper between and brick foundation, built in one end of the mow of your barn will not be over one dollar per ton capacity, if you have to buy all the lumber and material and pay for all the labor; but by furnishing the material and doing the work, the cost need not be more than twenty-five cents per ton.

Second, the loss in the caring for the crop by this method need not be over one-half as much as it will be by the ordinary method, even under the most favorable conditions.

Third, about twice the amount of feeding value can be obtained from an acre.

Fourth, it furnishes a variety, as you have all the other feeds in addition, and, in this instance, it is the staff as well as the spice of life.

Fifth, it saves toll and labor of grinding the corn as well as shredding the fodder.

Sixth, the corn is off the ground and out of the way for any fall crop.

Seventh, the manurial value, after allowing one-half for waste, is one-third of the cost, or fifty cents per ton.

Eighth, the man who has a silo is always increasing the productiveness of his soil, as he keeps more stock and thereby gets more manure.

Many more reasons might be added to the above but we will ask your indulgence but for a minute longer while we suggest who should *not* build silos.

First, those who stable their cattle around straw stacks or open sheds and who think feed a cheaper fuel than a warm stable.

Second, those who stable, but use the cracks between the weather boarding for windows, also the cracks in the floor for the best part of the manure to go through.

Third, those who turn their cattle out of the stable—unless it is the above kind—early in the morning and compel them to roam over the fields to keep warm, and after they have become too tired for that, to turn their backs to windward and endure the cold as best they may.

Fourth, those who only expect to *keep* their young cattle through the winter, and not *grow* them, or who think it does not pay to milk cows in the winter season, when milk is worth one dollar per hundred.

Last, but not least, those who forget that the merciful man is merciful to his kine, and that good housing and good care are as essential as good feed to the successful dairyman and stock grower.

THE CARE OF FARM IMPLEMENTS.

By W. D. HARMON.

[Read at the Farmers' Institute held at Richwood, Union Co., Feb. 19 and 20, 1897.]

There is an old adage that says, "It is not what one makes so much as what one saves that counts in the end." My subject has to do with saving rather than with direct gaining. With the low prices that have been prevailing for the past three or four years, and with drouth and swine plague diminishing our incomes, it is but fitting that we cast our eyes about us to see where we can stop or lessen the calls for money. With the proper care of our farm implements, we will be on one of the roads to saving. I do not suppose I will be able to advance anything entirely new, but if what I may say shall be to the advantage of any of my hearers I shall feel that I have not talked in vain.

The care of a farm tool should commence with its first setting up. As the machine comes from the shop the bearings are more or less daubed with paint.

It should be seen that all shaftings turn easily in their bearings before starting to the field or for whatever work the implement is to do. One of the best ways to accomplish this is to take about three parts kerosene (coal oil) and one part lubricating oil and mix thoroughly. The kerosene will penetrate the paint and soften it, while the lubricator will reduce the friction. Oil all bearings with the mixture and drive the machine around the farm yard. This is especially important in the starting of binders, mowers, and machinery of that class. After having "limbered up" (as the experts say) use good lubricating oil freely, "oil is cheaper than machinery."

It may not be out of place to say a word as to the office of oil and how it operates in the reduction of friction. Oil acts as a buffer between the revolving shaft and its bearing, very much on the same principle as the balls in a bicycle, so nearly does it resemble this that it has been called nature's ball bearing. The tendency of oil is to form little globular particles; these, rolling between the two metals keep them from coming in direct contact with each other, thus keeping the shaft from tearing small particles of metal from the bearing. It is this tearing of metals that causes the heating so common in machinery where oil is used sparingly. You have no doubt noticed that a bearing that has once been heated heats more readily thereafter. This is because its surface is not smooth and true and as the little globular particles of oil pass into the depressions they do not form the perfect bearing, they soon become of a gummy nature and lose their lubricating qualities. The question is often asked, as to the advisability of oiling cog or gear wheels. That depends on their location and duty. If they are located where they are exposed to sand or dust of a gritty nature, don't oil them; then the dust will not stick to the cogs; but if they are enclosed or are not exposed to grit, oil them by all means.

One of the most important things in the care of implements is the keeping of bolts tight. The alignment of the machine depends on this. On the proper alignment depends largely ease of draft (which, carried to its logical end, means a saving of oats and hay) and its capability to do its work properly. I remember making a drive of over twenty miles one hot Fourth of July to turn a nut half way round. When it was done the owner could not believe it possible that that was all that was needed, but it remedied the trouble, so he had to be convinced. I believe that sixty per cent. of the breakage of castings is due directly or indirectly to loose bolts or rivets. It will pay as good wages for your time as anything else you can do to go over your binder, mower and other tools at least once a year and tighten up all bolts, and where old ones are worn, put in new ones.

I was going to try and emphasize the importance of keeping farm tools under shelter, but since I see so many leaving their cultivators, plows, harrows, mowers, etc., outside, it may be after all that I am mistaken. There may be some advantage in having the plow already in the field for next spring's work, that, not having practiced it, I do not realize, but if that be true there certainly is no advantage in rusty mould boards and cultivator shovels, and having to work from a half day to a day and a half to get them clean. If you positively have no room for them in your barn or shed, get them in a close bunch and put boards over them, or corn fodder if you do not have the boards. But first try and get them inside, pack them as close and you will be surprised to find how much can be put in a small space. We had at one time in a space of thirteen by fifteen feet, a binder, mower, harrow, two two-horse cultivators, two one-horse cultivators, two breaking plows, a hay rake, a two-horse corn planter, a two-horse wheat drill and a one-horse five-hoe drill. This was done by taking the binder reel apart, the tongue and bar off the mower and gangs off the cultivators, so as to get all in the least space possible.

I believe it is economy to put these things inside, if the wagon has to stand out, the latter can be fairly well protected with a mixture of oil and red lead. I know it is not very pleasant to have to chop the wheels out of the frozen ground, but when you do get them out there is less liability of trouble from the wagon than

there would be from the other tools. What has been said, refers to the direct care of the tools. There are other things, which, while they do not have to do with the direct care of implements, greatly facilitate the work. The home repair shop I consider as one of those things that is indispensable on the farm. It is not necessary to have a building especially for a shop. We have our shop in one corner of the barn in a space of about eight by twelve feet. Of course, we would prefer a separate building, but what we have answers very well. Look around and you can find some place in which to set a bench.

I know every farmer cannot have a full set of blacksmith's and carpenter's tools, nor do I think it practicable for everyone to own his own forge, drill press, etc., this, however, depends very much on the location and the man. If one is quite a distance from a blacksmith, there will be times when they will not only be handy but will pay for themselves. Every farmer can and ought to have a bench with vice attached, a set of bits, saws, square, plane, draw knife, chisels, etc., for working in wood and a *good*, heavy cold chisel, not one of the cheap ones that come with the mowers, but one you can hit and hit *hard*, without fear of its flying to pieces, two or three different sized punches, a solid piece of iron to pound (we have a piece of railroad rail) files, screw drivers, wrenches, pliers, an assortment of bolts, screws, washers, etc.

Arrange the bits, chisels, punches, etc., in racks; saws, square and like tools on nails over the bench where they are in full view and easily reached; for the wrenches make a drawer in your bench by the vice. For the bolts and screws have a cabinet made by taking two boards eight inches wide by four feet long, and thirteen pieces, eight inches wide by sixteen inches long for shelves; plane one edge of the boards so as to paint; nail the short boards between the four-foot boards four inches apart, making narrow shelves; go to your grocer and get empty cigar boxes of the size holding fifty cigars, remove the lids and put three on each shelf; paint the ends of boxes and edges of boards with drop black and mark with white lead. We mark for the different lengths of bolts and have boxes marked for hog rings, copper rivets, iron rivets, washers, screws and unusual sizes of nails.

With the few inexpensive tools named above, more than ninety per cent. of the repair work in wood and much of the work in iron can be done. But some will say, "I can't use tools." Did you ever try? If so, were you systematic and persistent in your effort? Begin on some of the plainer jobs, taking the broken parts as guides and work up, you will be surprised at what you can do in a very short time. But if you cannot learn, or have not the disposition to learn, fix up a shop and encourage the boys to become handy with tools, don't start them out handicapped as you have been. It is well to have an assortment of timber, such as would be used for making double trees and whiffletrees. Boards of various thicknesses of different kinds of wood, should be kept on hand where they will be dry and convenient to get at.

With the right kind of material at hand, a bench and a few tools, there will be but few things that it is necessary to go to town to get repaired, which means a saving of expenditures and generally a saving of time—the equivalent of money to the average farmer.

Nor is the saving limited to small repairs. I have spoken of the necessity of keeping bolts tight to keep the implement in working order. Let me give an illustration or two that have come under my own experience. In 1886 we sold a binder. I went out to set it up and start it. I noticed everything was doing for itself, corn planter still in the field, plows in the fence corners, nothing taken care of. I did my work, returned home and reported the purchaser as very careless and apparently hard up, although he had been recommended as "O. K." At the end of three years the machine was only two-thirds paid for and the man financially insolvent. He told us to come and get the machine. Well, we went after it and found the canvas elevators doing duty as the roof of a building, the chains were being used for a swing by the children, while what was left of the reel served as a hen roost. We

looked around and asked ourselves, "Is it any wonder he assigned?" We got the machine up out of the ground, took it home and deposited it in our shop. When it went in, it was so badly out of line that it would not run at all, the bearings were worn until there was danger of the cogs not meshing. I went to work on it and with a vigorous use of wrench, punch and hammer, free use of babbitt metal and an expense of about five dollars brought it out in two days' time so that it worked as well as it ever did and has done all of our harvesting since, giving us no trouble except the breaking of slats on the elevators and making a new reel. Again, some three years ago we bought at a sale a grain drill for one dollar and twenty five cents. The wheels were solid, but the frame was out of line and sadly in need of new points. We put in a day's work straightening, cleaning and painting, put on new points, which cost us one dollar and twenty five cents, making a cash outlay of two dollars and fifty cents, and we have a drill that will do as good work as any in the neighborhood. I mention these two instances to show that it is not merely a theoretical, but a practical saving, one that counts in that which we are all wanting, dollars and cents.

I am often asked, "Where do you get the time? I never have the time to do such work." This has been answered in part already. Most of the smaller jobs can be done in the time it would take to go and come from the village workman, but the greater part of it we do on rainy and disagreeable days. We have in our shop a nicely planed board about twenty inches long and four inches wide, with a hole in one end to hang it up by, and on this we make memoranda of indoor jobs as they occur to us and do them when it is too rough to work outside.

In closing, let me urge, first of all, if you wish to take proper care of your implements, study the construction of the machines. Every piece has a duty to perform, and if one understands the details of the machine he can soon locate trouble.

Keep bolts tight.

Use oil freely. An old, worn bearing requires more oil to make it run easily than a new one but I believe in practice the old machine gets neglected.

By all means, keep your implements under cover. Standing out from one season's work to the next is harder on them than doing the work. Have a place for each tool, and see that it is in its place, so that when you want anything you will know just where to find it.

Have your home repair shop and do your own repairing as far as possible. It will save you many dimes, and remember, "a penny saved is two pence earned."

WEEDS AND LEGISLATION THEREON.

By HON. D. J. CABLE, Lima, O.

[Read at the Farmers' Institute held at Harrod, Allen County, February 1 and 2, 1897.]

There are many subjects which I would take more pleasure in discussing than this one—as, for example: What is the cause of the present depression in all agricultural pursuits? Why do European farmers import Chinese Coolies to work on the farms of Europe, while Europeans emigrate to this country to remain in idleness? Why are we taxed to prosecute and support the criminals of Europe who are sent here without restriction, just so they can read five lines of the Constitution of the United States in any language and are possessed of property to the extent of a few dollars? Why we should permit the vast numbers of paupers to be sent from

Europe to fill up our poor houses and be supported by taxes levied upon us? I should like to discuss these questions, but I am confined by the committee to "Weeds."

There is no subject concerning the management of the farm to which the American farmer should give more attention than "Weeds"; but I am sorry to say that it receives less consideration on his part than any other.

Let us first consider some of the evils that follow, as a direct consequence, from the growth of weeds. The farmer devotes about one-third of his time in eradicating the weeds, whereas, if no weeds grew upon his land, he could give more time to the raising of crops, and would raise larger crops and of better quality. The weeds rob the soil of its fertility; they choke the growth of the crops; and, sometimes, a heavy crop of damp rag weed will, when threshed with the wheat, cause it to spoil and thereby occasion a direct loss in the amount of wheat raised and the quality of that threshed. The man who will allow weeds to go to seed on his land and spread to the land of his neighbor, who has kept his land clear, is a public enemy and should be dealt with accordingly.

There are many other evils which arise from permitting weeds to grow; it does not help the flavor of milk or butter to restrict the diet of the cow to rag weed exclusively, when by judicious foresight, more clover could just as well have been grown where the rag weed grew.

Weeds are unsightly and obnoxious; they destroy the beauty of a good farm (and they will grow with more ease on a good farm than on a poor one); they lower the value of a farm from one-third to one-half, and, if the growth of the weeds continues uninterrupted for a number of years, the depreciation in value is greater.

HOW DISTRIBUTED.

There is always a strife between the various plants and weeds as to which shall occupy the ground. Some plants crowd others out. Those producing great numbers of seeds will often occupy the ground against those which produce fewer seeds. Then, again, some plants, like the thistle or wild lettuce, scatter their seed to the four winds of heaven, while the seed of the yellow dock is dropped close to the parent stock. Weed seeds are scattered with wheat, grass, clover and other grains. Some of our worst weeds have been brought into this country in shipments of cheap clover and other seed. And, right here, permit me to remark, Congress ought to prohibit the importation of cheap and worthless seed from foreign lands, and the legislature ought to forbid the many fake seed houses in this country from shipping into Ohio, unless first tested. Weed seeds are carried and transplanted by birds and animals, by the wind, by currents of water down streams and ditches, along highways and along railroad right-of-ways. They are sometimes planted by foolish persons and thus a start given them so that others may be afflicted. Old fence rows furnish a steady and undiminished supply of weed seeds and so do old abandoned corners and uncultivated lots.

RAILROAD RIGHT-OF-WAYS.

The railroad right-of-ways are the means of furnishing the farmer an inexhaustible supply of obnoxious weed seed, the right-of-ways being long narrow strips of land adjacent to so many different farms, will soon seed such adjacent premises. The weeds are often permitted to grow on the right-of-ways until they go to seed. The numerous trains carrying live stock, seed the right-of-ways from one end to the other. This is demonstrated by the great variety of weeds growing around Chicago, where so many railroads center.

SOME OF THE MOST TROUBLESOME WEEDS.

Wild lettuce, Russian thistle, Canadian thistle, Spanish needle, oxeye daisy (a species of the *chrysanthemum*), wild and black mustard, purslane, stick weed or beggar's lice, burdock, yellow dock, bracted plaitain, horse nettle, buffalo bur, wild carrot, rag weed and dog fennel.

Some of these weeds are annuals, some are biennials and some are perennials and a knowledge of these distinctions enables the farmer to intelligently deal with the pests. Take, for example, the common burdock; it is a biennial—that is, it grows from the seed, and the first year it grows large leaves but does not throw out any seed stalk; the second year, it goes to seed, and its burs containing the numerous seed pods will stick to live stock. Did any of you ever see sticking to stock these burs to be threshed out in the pastures and over the farm, thus scattering the seed? Now, during the first year's growth of a burdock, there is no use to cut it—in fact, it does more harm than good; but the second year, when it sends forth its seed stalk, just before it blossoms, cut it down in the vigor of its evil existence, and it will be dead forever. On the other hand, the yellow dock is a perennial, like timothy, and is a very mean weed. Its seeds do not spread so easily, but cutting it off does not kill it. It should be dug up, root and branch, and cast into the fire, that its seed may perish from off the earth.

Some weeds, especially annuals or biennials, may be killed by mowing them just before, or at the time, they blossom, but there are other weeds which cannot be killed by mowing after they are in bloom—for example, the Canada thistle will mature its seed even though it is cut down immediately after it has blossomed, as there is enough sustenance in the stalk to mature the seed.

The wild lettuce you all know very well, though the acquaintance is somewhat brief and disagreeable. It is a biennial, sometimes annual. It came to this country from Europe; its seeds are lighter and carried more easily than the thistle; it is a hardy plant and should be pulled out by the roots. The stem, close to the ground, is prickly and cannot be pulled without a covering on the hand. It is most troublesome in meadows; sheep will eat it and keep it in check in pastures. A full grown plant will produce about ten thousand seeds. There is a fungus which comes with this weed which will attack cultivated lettuce. When cut near the ground it will send up additional sprouts which will go to seed.

The Russian thistle first appeared in Dakota in 1873, and is now found over the greater part of the state. In some places the fields have been abandoned. It was first noticed in Ohio in 1894 along the tracks of the Lake Shore Railroad near Bryan. It is one of the worst weeds known, and a large portion of Europe is afflicted with it. It is an annual and should be cut down when it first blooms, for one plant will produce about twenty thousand seeds.

The Canada thistle grows about two feet high; has prickly leaves, rose purple flower, and is the lightest colored of all thistles. It has the power of reproducing itself from roots as well as seeds. It is a perennial plant, and therefore more troublesome than either the wild lettuce or the Russian thistle. It is often shipped from place to place in baled hay. It originally grew in Europe and not in Canada, but it reached this country from Europe through Canada. It is more common in Canada than in the United States. While it is more difficult to suppress than the Russian thistle, the Russian thistle is much more injurious. The better way is to never permit this pest to mature on the farm. After it, or any other weed once obtains a foothold, the labor multiplies many times to suppress it.

The Spanish needle is an annual and may be suppressed by mowing before the seed can mature. It is a very troublesome plant and should be suppressed.

Wild and black mustard are annuals—that is, they produce seed each year. The plants themselves die and the following year, the seed will grow and mature seed.

After the ground has become full of this seed, the successful way to treat them is to mow each year, just as they bloom. If this be done for two or three years, the plants can be destroyed. But if the plants be growing in a meadow they will mature seed before the grass is ready to cut, so that such fields should be pastured or cultivated.

Purslane you are all acquainted with, from its fleshy leaves and stems. It is a creeping plant, but can mature more seed to each plant than any other known plant. It is estimated that one plant will bring forth a million seeds, and it may be very troublesome when the ground becomes thoroughly seeded to it. The way to kill it, is to cut it off when it has reached a mature size, and before it has produced seed, and turn it to the sun. It is an annual, growing each year from the seed.

Stick weed or beggar's lice are troublesome little seeds that will stick to animals and especially to the wool of sheep, but are easily suppressed if mown during their growth.

Bracted plaitain is a plant that grows annually from the seed, and may therefore be suppressed.

The buffalo bur you are no doubt all familiar with, and it is easily suppressed, provided the plant be cut off before it goes to seed. It is an annual, and will not reproduce itself from the roots.

Wild carrot is a very bad weed, and if there be but little of it, it should be dug up by the roots, and always, of course, mowed just at or before the time it blooms. It is a biennial.

Rag weed is the most common weed in this country, and the best time to suppress it is when there is plenty of moisture to germinate all the seed; then mow off the weeds before the seed can mature; rake them up and let them rot, as they contain a good deal of fertilizing material.

Much injury was done to the wheat last year because of the rag weed, there being so much rain that when the wheat was threshed, the rag weed being wet, caused some of the wheat to spoil, whereas, had there been no rag weed with the wheat, it would have dried out so as to have done no injury. Thus thousands of dollars were lost to the farmers of Allen county alone because of the rag weed. It is an annual. The roots never reproduce; therefore, mowing the ground, or cultivating it for two or three years, will destroy most of the seed. If the ground is thickly sodded, it will choke out the rag weed, but the seed will retain vitality for some length of time, so that when the meadow is broken up the rag weed will again appear.

There are many other weeds that might be mentioned, but the same rule applies to the manner of suppressing them.

One of the greatest items of cost in the production of a crop is for labor expended in the extermination of weeds in order to give the crops a chance. If there were no weeds produced from the soil the later cultivation of the crop would not be necessary. The value of the field crops in the United States for the year 1894, including wheat, corn, oats, rye, barley, buckwheat, tobacco, potatoes and hay, was one billion, six hundred and thirty million, eight hundred and seventy-three thousand, seven hundred and ninety-five dollars. Direct loss to machinery and stock and decrease in value of crops by reason of weeds, amounted to ten million dollars.

REMEDIES.

I. Have proper laws enacted, providing that all roads and highways, public and private, as well as fence rows, be kept clear of weeds and the road sides be kept in grass sod, including the banks of all ditches and water-ways.

That all towns, cities and villages be required to keep the highways and public places clear of weeds, and also all commons within the towns.

That all private property in the towns be kept clear by the owner, and upon his failure the road officer be required to enforce the law at the owner's expense. (Of course

the farmer cannot complain of his city neighbors about weeds when he allows the weeds to grow everywhere in the country; but, after he has suppressed them in the country, he can require the same to be done in the towns and cities.)

That all railways within the state be required to subdue all weeds promptly, so as to prevent their spread or maturity upon their right-of-ways along the side of the tracks and maintain a grass sod.

That the owners of all farms, or their tenants, be required to subdue all weeds that can spread to the neighboring lands.

The farmers should do their part. Ground not being cropped should be in grass, as this is one of the best means of suppressing weeds and choking out their growth. The weeds should be cut long enough before maturity to kill the plant and its seed, if an annual; the root spudded out or growth cut the second year, if biennial; and it should be dug out by the roots if perennial.

II. If the ground be cropped all weeds should be burned to destroy as many seeds at surface as possible. Then the ground should be plowed and cultivated, so as to induce the seeds of the weeds to germinate and then destroy the seedlings which can be done easily at this time, as most all of the common weeds germinate at or near the surface, so that a weeder can be run over the ground destroying all the growth of weeds without injuring the growing crop.

Weeds bearing mature seeds should, under no circumstances, be plowed under. Most weed seed will retain their vitality several years in the ground, and when plowed under, some will germinate each year.

The meadows should be gone over with a hoe or mattock, and thistles, burdock and sour dock be cut off. All prickly lettuce should be pulled out by the roots and if weeds come up in the meadows they should be mown; one or two times after harvest, at the most, will put the meadow in fine condition for the next year, if the weeds that a mower does not reach are cut out. Have all fence rows in grass and keep them free from weeds and underbrush. Mow all stubble land about two weeks after harvest; if seeded to grass or clover mow above the short grass. Keep a few sheep, whether there is a tariff on wool or not, as sheep like to eat some weeds, and by putting salt on others they may be induced to eat them.

Do not let fields lay bare in the fall and winter, such as oats and potato fields, in which the weeds may grow and go to seed, but sow to rye. This will suppress the weeds and grow a crop that can be turned under as a fertilizer.

SEED HOUSES.

Be careful when you buy seed that it comes from a reputable house. Some of the seed houses do not raise their seed but buy it promiscuously or ship it from Europe when it is cheap there. Some seed houses distribute garden and other seeds to various places to be sold, but if not sold, they take up packages left over. Now, just imagine this seed being returned and being put into new wrappers and thus put out year after year.

Then, if all farmers will co-operate for two or three years, great good will be accomplished and the weed pest be eradicated. I cannot suggest an easier way, and, if the farmer will study the nature of the weed plants, he can very easily direct his labor so that it will be effective.

LEGISLATION.

The present law with reference to weeds is seriously defective, as well as some other laws relating to agriculture. The law does not undertake to define as weeds many noxious and injurious plants, but simply speaks of Canada and Russian

thistles, wild lettuce, wild mustard and "other noxious weeds," which latter expression is so indefinite as to mean nothing. In brief, the law is inadequate to deal with the many conditions that exist and arise with reference to the suppression of weeds.

The law should first undertake to define what are noxious weeds and should include the names of at least twenty of the worst. It should provide for the suppression of weeds upon all public property, roads, highways, in cities and villages, along right-of-ways of railroads, along streams of water and ditches. The law should specify the time when each of the weeds named should be dealt with. It should require the owners and occupiers of lands to suppress all weeds growing thereon, which do, or may, send their seeds or roots to adjoining premises to infest other persons' property.

It should further provide that the owners of land should have a right of action against the owners or occupiers of adjacent real estate, who permit weeds to grow and spread upon their property.

The law should further provide that some official in each locality should have authority, on short notice, to go on private property and suppress dangerous weeds and tax the cost to the owner of the land.

Laws of this nature properly enforced, would, within a short time, change the appearance of the entire country and directly benefit the farmer in a pecuniary way greatly in excess of the cost of suppressing weeds.

WEEDS.

By MRS. LIZZIE OSBORN.

[Read at the Farmers' Institute held at Marengo, Morrow County, Feb. 19 and 20, 1897.]

Perhaps there has not been a time for a number of years when *weeds* have so persistently pushed themselves forward, growing luxuriantly under the eye of the beholder in garden, lawn, cultivated field, pastures, roadsides, *everywhere*, as during the year 1896. The constant and heavy rainfalls which rendered their complete destruction well nigh impossible, were just what they wanted to make them grow tall, strong and healthy, and to mature an enormous crop of seed, which will bring forth fruit of its kind for many years to come. If the proverb "One year's seeding makes seven years' weeding" be true, our work for the next few years is already mapped out for us. Nevertheless, we must come to the conclusion that if we had been as faithful in destroying the weeds in other years when conditions were more favorable, as we should have been, there could not have so many grown during the past year. In riding along some of our roads last fall, one was reminded of the traveler who came to Ohio for the first time by way of Toledo.

It was very early in the morning, and after taking the cars he looked from the window as they passed along, and saw long lines of what appeared to be hedges; but as the light improved he discovered that these hedges were composed of tall weeds, hiding the fences. We cannot wonder that he asked himself the question, "Are there no scythes in Ohio?"

What is the remedy? How can we rid our farms and roadsides of these pests? I answer, by united effort. A long pull, a strong pull, and a pull all together will do wonders. If eternal vigilance is the price of liberty, surely liberty is worth working for, and is prized in proportion to the effort that is made to gain and retain it. Mow the roadsides at least twice each year, not waiting till late in the sea-

son when the seed is already matured; go over meadow, pasture, and wood lots, with scythe and hoe in the same way, cutting out thistles, docks, mulleins, etc., early, and white top, rag weed and Spanish needles later; be careful not to let any weed seeds mature, and the improvements will soon be so great that our hearts will be encouraged to go on to final victory.

To gain this, we must enlist the help of the children. Begin by teaching them the names of the plants; tell them about their characteristics, their peculiarities of root, leaf and blossom. Show them the burdock, with leaf like the rhubarb, its thick fleshy root, and circular seed sacs which have the power to adhere to almost everything that may come in contact with them. Tell them how these may be carried from one place to another by the animals on the farm, and unless they are cut and burned before that can be done, burdocks which are not good for these animals to eat, will grow on the farm where grass ought to grow. Let them see for themselves how easily the Spanish needle can be pulled up by the roots when it is small, not pulling other plants up with it, but if we wait till it gets larger, the ball of roots at its base will bring enough dirt up with it to displace the plants which we do not want to be destroyed. Let them count the number of seeds which grow in one cluster or blossom of this plant, then the number of blossoms, and see how many times this one seed has multiplied itself. Let them see how many varieties of weeds they can find, and if there are any which are new to you, or which are not known to you by name, try to find out what they are.

Some years ago, Prof. Thomas Shaw, of Ontario Agricultural College had a series of articles in the Ohio Farmer on the different kinds of weeds, and how to get rid of them. The thistle, Canada and common or bull thistle, wild carrot, golden rod, oxeye daisy, wild oats, blue weed, pigeon weed, wild flax, sow thistle, rag weed, horse weed, wild mustard, plantain, English and common, couch grass and chicory, were each illustrated and described very plainly. I well remember how pleased I was when on the road to Mt. Gilead, I recognized chicory, which I had never seen before, by the description given of it in the Farmer. At one time we moved to a place where the burdocks flourished under the trees in the orchard, in the fence corners, stone heaps, etc., and I did not want them there; so I took my butcher knife and cut them off as far below the surface of the ground as I could reach. Every one that I could find was sacrificed, and when we left there I do not think a burdock grew on the place. I became so interested in it, that wherever I went, if there was a burdock within the line of my vision, I saw it. Now I can see a Spanish needle as far as a burdock, but we are not rid of them yet. To do effective work we must have an intelligent interest in that work, and I wish that every teacher in our public schools were required to teach the elements of botany,—how plants grow. I am glad that it is taught in the high school here, but I think it should begin in the primary room. There are books, however, finely illustrated, which we can have in our homes, teaching us what we need to know and which our children should know, but they cost money. Of course they do—but let me tell you something. John Gould, of Aurora Station, Portage County, is said to have one of the finest private libraries in the state, the result of a promise made sixteen years ago, to the lady who is now Mrs. Gould, that instead of smoking two cigars a day, as had been his custom, he would put the price of those cigars in books,—a promise which he has faithfully kept. Would that in every case, “A word to the wise were sufficient.”

Last fall, I saw two little boys in a field cutting thistles; they worked steadily and hard, and I felt like cheering them; but I noticed that they had to use a good deal of force in striking with their hoes, often taking two or three blows for one thistle, and I thought Prof. Shaw's *spud* would do the work much easier for them, and be better in every way. It is described thus: “The length of the spud including the handle is about forty-five inches, the length of the blade eight inches and breadth

two and one-half to three inches. The blade is quite thin, becoming more so toward the cutting end. In fact it is a sharp chisel, with a long handle, and altogether weighs about one pound." Prof. Shaw is enthusiastic in its praise, and declares if ever this continent is to be made clear of weeds and kept so, it will be by the use of the spud. While we are studying to free ourselves from that which is unsightly and hurtful in our material surroundings, let us not forget that there are environments more dangerous to our moral and spiritual welfare, against which we need to wage perpetual warfare in order that "we may keep ourselves unspotted from the world" and that we may so instruct our children that they, being forewarned may be forearmed against that which would destroy the beauty and symmetry of their characters. Teach them the names of those weeds and the effect of them—disrespect and irreverence, self-indulgence, idleness, prevarication, willfulness, profanity and impurity, the use of intoxicants and narcotics, disregard of the rights of others, speaking evil of dignitaries, and a host of others that will occur to you as you think of these things. Sometimes, when we have done our best to clean our own land of weeds, a neighbor who has not been so careful permits his weeds to foul our land, and again when we have done the best we know to sow good seed in the minds and hearts of our children, some one, who does not care for these things, sows foul seed among that which is good. This is discouraging and sad, but as plenty of good seed with good cultivation will choke and destroy the weeds which try to grow in our fields and among our grain, so will faithful teaching and careful weeding be rewarded with clean minds and true hearts in our homes and family circles. Let us look up, lift up, and lend a hand until our communities are free from weeds, both vegetable and spiritual.

FRUIT FOR THE FARM.

By SAMUEL TAYLOR.

[Read at the Farmers' Institute, held at Grove City, Franklin county, December 7 and 8, 1896.]

In presenting this subject, I will take the position that every farmer should raise his own supply of fruit, although that is against the advice of many who write on this subject, who claim the general farmer can buy his family supply of fruit cheaper than he can raise it. I will admit it does not cost much to supply the average farmer's table with fruit, for this simple reason, they do without, and live on bread, potatoes and pork, and it will always be so while the farmer depends on buying his supply. These hard times the farmer cannot afford to be always spending his hard earned dimes to supply his table with fruit. So if he has fruit it must be produced on the farm.

Any person who rides through this country with his eyes open, will be forced to the conclusion that the farmers are not well supplied with fruit, with probably the exception of apples. He will see fine houses, big barns, and all the modern improvements in the way of farm machinery, wind pumps, etc., but very rarely see a farm that is even poorly supplied with fruit. What is more bare and unhomelike than a farmhouse standing out in the hot sun of summer, and exposed to the storms of winter, without even an attempt to surround it with trees, that would add so much to the comfort and beauty at such a small cost; and more yet, they would furnish fruit for the family. Who can blame the boys for getting sick of the farm and crowding to the cities and towns? It is work, work, work, and pork, pork, pork, from one year's end to the other. How much it would add to the pleasures of that family, and how it would astonish the boys, if instead of a plate of hot grease with

the fat pork swimming around in it, they would see a heaping dish of strawberries. It would be remembered by them as a milepost along the journey of life. Then if that could be duplicated at every meal for four or five weeks, to be followed in their season by raspberries, blackberries, cherries, grapes, pears, plums, peaches, quinces and apples, why, you simply couldn't drive that boy off the farm, because a boy loves fruit as naturally as a duck loves water.

It is not an unusual sight to see, on a hot July day, the wives and daughters of well-to-do farmers foraging along the roadsides and edges of thickets for a few berries, to give a change and relish to the evening meal—farmers who raise hundreds of bushels of wheat and corn, depending upon the fence corners for their supply of blackberries and raspberries, when the same can be grown as cheaply, as easily and almost as surely, bushel for bushel, as the corn and wheat. Is it any wonder their sons, seeing the teeming city markets, think the city people have the most of this world's good things and leave the farm at the first opportunity? Of the two hundred and forty-three regular meals, between the 10th of June and the 1st of September, how many, on farmers' tables, are graced and brightened and made more palatable and toothsome, by a dish of berries? I doubt whether in the whole state of Ohio the average would be one-tenth. In other words, I doubt whether each farmer's family, during the season of berries, indulges more than twenty-four times in what berries they could healthfully eat with their regular meals. I doubt whether any farmer can take a list of one hundred of his neighbors and strike off seven names of those who make it a point to have a liberal supply of strawberries every year. Of those who raise raspberries (or rather let them raise themselves), the percentage is larger, but still sufficiently small. Such being the case, the question arises, what is the reason? I think there are two reasons. One is a lack of knowledge concerning the cost of growing and methods of cultivation, and the other is a false estimate, or a failure to estimate the true value of fruit as an article of food.

Again, why is it that farmers, while supplying their farms with everything else to make home attractive, neglect the fruit? There are several reasons for this. One is the almost universal opinion that there are deep and wonderful mysteries in fruit growing, and only the initiated can succeed. This is all a mistake, as fruit culture is no greater mystery than corn or potato culture, if you get the right varieties. But here comes the rub—to select the varieties. This is the rock upon which most farmers are shipwrecked. The average farmer knows nothing about the varieties. With him a strawberry is a strawberry, and a grape is a grape, and a plum is a plum, and when he gets the other things fairly fixed up, he determines to raise a supply of fruit for his family, and while he is about it he will have the very best; but instead of adopting the course of a wise man, and going to a nurseryman in his neighborhood, or sending to a nurseryman who sells trees to the grower that will be a joy to him the rest of his days, and a blessing to his children, he waits until a smiling, smooth-tongued fruit agent comes along, who is not long in finding that something fine is wanted, and he has it to sell. A bloomless, seedless, coreless apple, a grapevine raspberry grafted on a honeysuckle, that will run clear around the garden on top of the fence, and begin bearing in the spring on one side of the garden, and keep on bearing around the garden all summer till stopped in the fall by frost, or an ever bearing, thornless, tree blackberry, that grows up like a cherry tree, and bears the year round, and so on *ad infinitum*. The farmer believes the oiled lies of the agent, and buys all these astonishing things, and pays six prices for them, even if they were as represented, thinking that now he is going to have fruit, he will have the very best and simply astonish the natives, and he would, too, with a vengeance, if the things would pan out, but unfortunately they won't pan.

In due time, along comes his purchase, that is remarkable only for its insignificance, and looks more like a bundle of dry sticks than anything else; but,

nothing daunted, he plants the trash and takes the best care of it. Most of the things die, of course, a few make a feeble growth, and after a great deal of care and patient waiting, prove to be of no value whatever, and he, for all his money and care, has a few worthless seedlings; he concludes he can't grow fruit and wont try any more, blaming himself for his failure, never dreaming that it is possible that that the tree agent lied, and sold him some stuff that the best horticulturist in the state couldn't make bear fruit. The trouble was all in the beginning. He did not start right, hence his failure. He did not fail because a farmer cannot raise fruit, but because he was trying to raise figs from thistles. That is the wrong way.

Now let us examine for a few moments the proper way to start a fruit garden that will not be a failure, unless neglected and allowed to grow up in weeds and grass. The first thing to be considered is location and soil. Much depends on a right start; don't make up your minds that you can plant out an orchard and it will take care of itself; if you do you will find you have made a costly mistake. Eternal vigilance is the price of a good orchard, as of any other good thing. You must eat fruit as well as bread by the sweat of somebody's brow, if it is the hired man's.

Having said something about soil, let us consider fruit trees. Now comes the tug of war, to get reliable stock, true to name. Buy only of the oldest established nurseries, that sell direct to the grower, having a reputation for straight goods, or, what is better, raise your own trees. This is not half so difficult as most people think it is. I can teach any smart young man in thirty minutes to graft or bud successfully, so that with a little practice he can bud or graft very fast. In this connection I want to say, give all tree peddlers a good letting alone, have no dealings with them; if you do you will be sorry, as nine-tenths of them are swindlers, filling their orders with trees bought wherever they can buy the cheapest, regardless of whether they are true to name or not. The labels on the trees will be straight and they will see to it that they get straight money for the trees. These are the only straight things in the deal. Be careful what you buy; never buy stock because it is cheap; the best is the cheapest always. Medium-sized trees, I think, are the best. Reject all trees with bad roots, or dried, shriveled appearance, and all grubby trees. Buy nothing but first-class stock, and contract with the nurseryman that you are to be the judge when they arrive, and you will almost be sure to get good stock.

Set your trees in the fall, if possible, as the ground is generally in better condition than it is in the spring; then the soil will get settled around the roots during the winter, and your trees will make an earlier start than they will get in the spring. If impossible to set in the fall, get your trees in the fall and heel them in on some dry piece of ground, laying them down at an angle of about twenty degrees, and covering well to within one foot of the top. Set as early in the spring as your ground will work dry; never set in the mud. Prepare your ground as for corn. Set your apple trees twenty-five feet each way, and also your pears; peaches and plums, ten by fifteen feet; quinces, ten by ten feet. Set your trees no deeper than they grow in the nursery. Many a man has made a costly mistake in setting trees too deep, especially on clay land. Lean your trees to the southwest at an angle of about twenty degrees. They are not so apt to sunburn, and, as the prevailing winds are from that direction, by the time your trees are four years old they will be fully straightened up, and as the boy said, "they will stand so straight they will lean the other way." Cultivate your orchard thoroughly. Never let weeds or grass get possession.

Pruning—Now comes the most important branch of fruit culture, which would be too lengthy to go into detail, and the branch that is least understood. I think it perfectly safe to say more orchards have been ruined by bad pruning than by not pruning at all. When your trees are one year old, cut away all the new growth except not to exceed six buds, coming out alternately. Avoid crotches as much as possible; better to sacrifice one branch than to let two come exactly oppo-

site. Cut the shoots that are left back to three or four buds; leave the end bud on the side in the direction of which you want the end branch to grow. If your trees have done well, when they are two years old you will have a new growth of from two to four feet; cut this back about two-thirds, clipping in all small twigs at least one-half, and so on until your trees are eight years old, when the plum, peach and quince will be nearly as high as they ought to get.

Now, let us take the farmer's orchard. I would like to make some general remarks as to its relative and particular importance. First, its economy; and by economy I do not mean that miserly saving by which we deny ourselves the necessities of life in order to put money in our pockets. If we produce our own fruit we have it in abundance, almost without cost, instead of buying the products of distant lands, the prices greatly enhanced by the profits of dealers and the cost of transportation. The shelves of our country groceries are filled with the canned products of other regions and it is not uncommon to see farmers buying these things when they could just as well be produced at home.

Second, the beneficial effects on health of the constant use of fresh fruits. This is of very great importance, and is universally conceded.

Third, it adds greatly to our comfort and happiness by the direct and immediate gratification of our tastes and love of the delightful and beautiful in nature.

It has been said that whoever can make two blades of grass grow, where only one grew before, is a public benefactor. This is just as true of that grower of fruit who improves or increases the fruit product, and moreover, it may be imputed to him for righteousness; for is it not written "that by their fruits ye shall know them?"

First in importance is the apple orchard. Generally this is the most neglected spot on the farm, and the product, as it appears when on sale in stores of this and other places in the country, is just what might be expected from the condition of the trees. Moss grown and old before their time, strangers to the pruning knife and saw, veritable thickets of dead and decaying branches and rank water sprouts, it seems wonderful that they should ever bear any fruit at all. Such an orchard may be restored to usefulness, and if made up of good varieties, it is better to take that plan than to cut it down and commence anew.

Make your feeding lot for hogs somewhere else. If there is any such thing as the "root of all evil," it is a hog's snout in the orchard. It may be proper to allow the pigs an occasional run in the orchard during the time that the wormy apples are falling, but that is all. In the fall apply a generous quantity of barnyard manure; plow shallow early in the spring, and harrow and cultivate through the summer until August; keep this up every time your orchard produces a crop, and, unless in the last stage of old age and decay, you will restore it to the vigor and productiveness of youth, and delight your heart with its ample returns of red and golden fruit. Unfermented manure should never be applied except in the fall, and never close to the trees. After this it is best to continue the cultivation, but it may be left off, provided the trees are mulched every fall with barnyard manure to prevent them from getting sod bound. Red clover should not be allowed as a crop among the trees at all. If the season should be dry, which is not uncommon, the long roots of the clover sap the moisture from the soil, and both tree and crop suffer. Do not sow any kind of grass in the orchard, but if cultivation is to be stopped, simply keep the weeds mowed down and allow the white clover and native grasses to come in gradually. Prune annually, top dress liberally every fall, and there will be no off seasons, except when the fruit is killed by late frosts in the spring. When the fruit sets too thickly it will pay to thin out while it is yet small; say as large as hulled walnuts. This may be very expeditiously done by wrapping a suitable pole with cloth so as not to bruise the limbs, and jarring the fruit off in that way. This im-

proves the fruit that is left to ripen, prevents breaking and greatly lessens the liability to off seasons.

It would probably be safe to say that not more than one farmer in twenty has, even in the most favorable seasons, an ample supply of pears running through the season from July to December. This is not living up to their opportunities, for pears are as easily grown as apples, and when the right kinds are grown they are among our most delicious fruits. The cultivation and treatment may be in every way the same as for the apple, except as to pruning, of which very little is necessary. The greatest enemy of the pear tree is the blight, the cause and cure of which is not yet understood by many farmers, but this should not prevent any one from planting trees when they thrive as well as they do in this country. Spray your trees about six times during the season with the sulphate of copper mixture, twice before they bloom and four times after the bloom falls, and you will not be bothered with blight, and you will have fewer knotty pears. The farmer will do well perhaps to confine himself to standard trees, because of the ease and simplicity of their cultivation and treatment.

The plum is another fruit that is almost a stranger to the farmer's orchard. This should not be, as it is a most desirable fruit both for dessert and cooking, and sometimes gives a full crop when other kinds fail. True, the black-knot is sometimes troublesome, and the curculio comes in for a share of the fruit; but there is no crop we raise that has not its enemies. Wheat is liable to the attacks of Hessian fly, to winter killing, to smut, rust and weevil, and when in spite of all these we have secured a crop, the profits may be cut off by the bulls and bears of the market, but the cultivation of wheat goes on all the same. So, of other things, and our fruit should be no exception. The same industry, skill and perseverance will bring their reward. Black-knot may be restrained by constant care and watchfulness, in cutting off and burning the knots. Many of the Japanese and American varieties are not subject to this disease at all. It is no great task to circumvent the curculio; spray and jar the trees, catch the bugs and kill them, tells the whole story, and there is nothing to hinder the farmer from having plenty of plums, and they will repay him for his labor.

Almost every farmer has cherries, and they are so hardy, do so uniformly well, and give so much for so little, that there is really no reason why everybody should not have them in profusion, and as to their culture, it is only necessary to say that it may be the same as the kinds previously mentioned.

The peach is the most delicious and the most popular of all the large fruits common to the temperate zone. It is not quite as hardy as the apple, and yet it adapts itself to a wide range of conditions, and its cultivation is common from Maine to Florida. On the farm its place is in the garden, or better yet, in an orchard to itself, as cultivation must be continuous, although the soil should not be too rich; about good enough to produce forty bushels of corn per acre will be near enough the mark. Plant budded varieties. It is all a notion that seedlings are more hardy and productive. Plant about ten by fifteen feet apart. Raise corn or any hoed crop on the ground until trees occupy it. Never cultivate later than August 1, and your frequent crops of peaches will cause your wife and children to rise up and call you blessed.

The quince is another desirable fruit that is too much neglected. This is a social kind of a tree, and likes a place near the house where it will give the most satisfactory results. Plant two or three trees in some sheltered situation, trim to single stems, keep off all water sprouts and suckers, top dress deeply every fall after they begin to bear, cut back half of the annual growth, and the crop is more certain than the apple. For jellies, preserves, baking, and canning they are unsurpassed.

The grape is another fruit of which there is not enough. The catalogues are full of new and choice varieties that should make one ashamed to remember that

the fox grape and the sour post grape were ever considered eatable. A grape vine may be planted almost anywhere and trained against a house, a trellis, or a stake, and almost any system of pruning that does not cut away quite all of the wood of the previous year's growth, will insure a greater or less crop of fruit.

In the garden also belongs the small fruit. Plant blackberries and raspberries in rows seven feet apart and three feet in the row. They need annual cultivation; cut out the old wood each year, and cut back the bearing wood in the spring to about two and one-half feet. Such a plantation properly managed will produce crops for many years, and the fruit ripens at a time when it is a very acceptable addition to the farmer's bill of fare, and if there should be a surplus it finds ready sale at remunerative prices. Of the red currant every farmer's garden should boast at least of a row, and also of a row of gooseberries. They require the same treatment as the currant. There is nothing better to my mind than the red Dutch currant either as to quality of fruit or productiveness. There are some that the tree agents like better because they can sell them at a higher price. There are several good varieties of gooseberries. Do not allow weeds or grass to grow among the bushes; a close sod would soon prove fatal; but they dislike deep cultivation, and the most satisfactory way of managing them will be found in an annual top dressing of barnyard manure. The currant worm is the only insect enemy that inflicts serious damage upon these fruits, and it is very easily destroyed. A little powdered white hellebore dusted on the leaves when the worms first appear will do the business, and there is no other fruit that is so certain to give good crops as the currant or gooseberry, and none more acceptable in jams and jellies than these.

But what can I say of the strawberry, with its lovely cheek resting upon the bosom of the earth, listening for the whispered formula by which that combination of juices, and flavors and tender, delicate pulp called the strawberry is created, and of which the good Dr. Johnson said that, "Doubtless God might have made a better berry, but doubtless he never did." Now, how many farmers have an abundant supply of this wholesome and delightful fruit? Yet they are as easily produced as potatoes. Plant in rows three feet apart and eight inches in the row, on good soil. Give good cultivation until the middle of August and allow them to spread and form a matted row. Mulch thinly, with straw or leaves, when the ground first freezes in the winter, and, if spring frosts do not blight your hopes, success is certain. Renew your plantation once in two years and you will always have berries.

For the fruit garden, I would advise you to select a piece of clay land, that is either naturally well drained or thoroughly tiled, and put it in condition to produce sixty bushels of corn to the acre in an ordinary season, plow as early in the spring as the condition of the ground will permit and get it into the best of order. Then go to a reliable nurseryman, or better to a successful grower in your neighborhood, and tell him you want to plant a fruit garden, and will trust him to select the varieties that will be best for you to plant, and he will advise as follows: Lay off your fruit garden ten rods long and ten rods wide, and devote the first rod in width to strawberries, which with rows three feet apart, will make five rows, select some good varieties, which will require five hundred plants. The next rod and a half in blackberries, three rows, seven feet apart, plants three feet apart in the rows. Devote the next rod to grapes; plant two rows eight feet apart, vines eight feet apart in the rows, which will require forty vines. Then a row of Richmond cherries, ten feet apart, sixteen trees. A row of pears, sixteen feet apart, two Keiffer, two Bartlett, two Seckle, two Anjou and two Flemish Beauty. A row of plums, ten feet apart, five Lombards, three Niagaras, three Duane's Purple, three Shipper's Pride and two Burbank. A row of quinces, ten feet apart, sixteen trees, ten orange, and six Meeche's Prolific, and still you have two rods in which to plant a row of currants and gooseberries. Twenty-five Red Dutch currants and twelve each of Downing and Industry gooseberries; and one row of peaches, ten feet apart,

sixteen trees, five Crawford, five Mountain Rose, and six Stump the World. And one rod in which to transplant your strawberries every two years. That fills your fruit garden, and your plants will cost about twenty-five dollars, unless bought of an agent, when they will cost anywhere from one hundred to one hundred and fifty dollars.

Now your lot is planted and we will consider the cultivation. It should be plowed about once a week. Put the narrowest shovels on your double shovel plow, and with a slow, steady horse you can plow right up to the plants. Once a month it will require a day's work with a hoe to keep it clean of weeds, in all about two days per month for six months, or twelve days a year. As for the results, the strawberries can be depended on to produce a bushel to the square rod or ten bushels, ripening all through June. That will give from two to four quarts for each meal, and three bushels to can for winter. Then the raspberries will produce about eight bushels, ripening through July. Three bushels for table use and five bushels to can. At the same time your cherry trees will furnish you with six bushels of cherries. The blackberries will yield on an average about nine bushels in August. In September you will have ten bushels each of plums and pears. And from August to the last of November you will have ten bushels of quinces, and your vines will reward your care with about fifteen bushels of grapes. From July to September you will have about ten bushels of peaches, if not killed by frost. To sum up the result, ten bushels of strawberries, eight bushels of raspberries, six bushels of cherries, nine bushels of blackberries, ten bushels of pears, ten bushels of plums, ten bushels of quinces, fifteen bushels of grapes, two bushels each of currants and gooseberries, and ten bushels of peaches, or a grand total of ninety-two bushels of fruit, for the use of ten rods square of ground and twelve days work in cultivation.

I have been extremely liberal in allowance of time to cultivate the garden. I think half of that time would be amply sufficient if done at the proper time. In fruit growing the old adage, "A stitch in time saves nine," is more than true. Kill the weeds when they are little, and it is not much of a job; but let them get the start of you, and you will have a big elephant on your hands. You need not rob your other crops of needed attention to cultivate your fruit garden, but use the scraps of time that would otherwise go to waste.

Such an abundance of fruit as this garden will yield, will save in an ordinary family, at least one hog in a year's supply of meat, and ten bushels of wheat in the bread, besides dollars and dollars in the grocery bill, in health of the family, and in the added pleasure of living will pay one hundred times the cost. You will not have to run to the grocery for prunes, currants, etc., in harvest and threshing times, but to your own fruit garden. The good wife will not have to roast herself over a red hot stove when the mercury is up among the nineties, baking dried apple pies, but put on a wide straw hat, and in a few moments have a heaping dish of strawberries to gladden the hearts of the weary men at the close of a hard day's work in the hot sun.

And now in conclusion, there is a grace and dignity in the cultivation of fruit, and a freedom from contact with the ruder elements of nature that attaches to no other branch of agriculture. The aged resident of the city, when he retires from business, longs for a place in the country, where, surrounded by trees and vines, by abounding flowers and fruits he may pass the remainder of his days in peace. Poetry, in all ages has been full of graceful allusions to the delights of horticulture; and the perfect picture of man's highest felicity of peace, prosperity and content is where he sits under his own vine and fig tree with no one to make him afraid.

THE NURSERY AND ITS METHODS AS RELATED TO THE FARMER.

By JOHN B. NOTESTEIN, Canaan, O.

[Read at the Farmers' Institute held at Creston, Wayne County, February 17 and 18, 1897.]

During my twelve or fifteen years experience as a nurseryman, I have listened to so many accounts of the dishonest, rascally and even villainous schemes resorted to by a large class of tree agents, to transfer as much as possible of the contents of your pockets to their own, that it almost makes me ashamed of the whole business. Were it not for the fact that the real nurseryman can truthfully disclaim any kinship with the loquacious gooseberry missionary, I verily believe that most nurserymen would quit the field in disgust. I know you generally catalogue us all together. You fail to recognize that our interests are entirely different. The nurseryman's constant aim is to furnish his patrons with the best of everything; and that every tree that he sells may be a living witness to his care and honesty. He knows that his mistakes are so apt to be construed as willful cheats, that he is ever on his guard, that he may build up a good reputation. The gooseberry tramp has no concern further than the present, for he never expects to work long in the same place. His only aim is to get your money, and he uses every means possible to accomplish this aim. Little he cares what you get in return. He tells you of the wonders of the Oriental, or Russian fruits. Shows you beautiful pictures, which are "much reduced in size, in order to get them inside a large plate book." He often shows you beautiful samples of fruits put up in magnifying glass jars, which have no more relation to the trees he will sell you, than pumpkins have to oysters. Such bottled specimens are very attractive, and are used to good advantage in taking orders. Let me tell you how this worked for one of these nice fellows lately. He was on the street in the town of Wooster, near the court house, showing to a large crowd a wonderful new currant, which was the sole property of his house. His samples were in bottles, and his audience was influenced to the point of giving orders, when he gave the bottle into the hands of some one in the crowd, that he might book the orders; just then, by some accident, that precious bottle fell to the pavement, and was smashed to pieces; the sympathizing bystanders began to pick up the precious giant currants, to save for their unfortunate benefactor; when some fellow with more curiosity than faith, began an examination of one of the giants, when it was discovered and announced that they were not currants, but small red tomatoes; you can imagine that the wily agent did not wait to collect his samples, nor to book orders, but made it his business to hunt the crookedest way out of town. This scheme of claiming the sole ownership of some wonderful new fruit or flower is a very successful one in the hands of the professional salesman. It was by this scheme that those parties near Smithvill were beguiled into the trap, a year or so ago, and paid three hundred dollars for one thousand peach trees, when seventy-five dollars would have been a fair price.

Again they tell you that your home nurseries do not understand the correct methods of propagation, nor do they use the right sort of seedlings, etc., etc.

They tell you that all but their firms use piece roots; cheap, snide stocks; but that their trees are grown on some secret, high priced roots, that will certainly ensure them to refrain from blossoming till all frosts are past; that they will be blight and bug proof; they will bear early and annually. In short, they enumerate all the desirable features their prolific imaginations can suggest. So to secure such a boon, you gladly give your order, regardless of price.

Now, my friends, you see that if you understood these matters better, you would not fall such an easy prey to such imposters. So to fortify you against at least some of these frauds I wish to tell you briefly, some of the methods of the nursery.

We plant the seeds of the different kinds of fruit trees; these produce what are called seedlings. These little seedlings would grow into fine trees, but in accordance with nature's plan for the hybridization of the fruits, probably no two would produce the same sort, so in order to have trees of certain varieties, we only use the roots of the seedling trees, and upon these roots we graft or bud the variety wanted, and from this graft or bud the tree is grown. We know then, positively, just what sort of fruit the tree will bear. It has been proven ages ago, that the best stock, or root, possible for the tree to be worked upon, is one of its own kind; that is, apple on apple roots, pear on pear roots, etc. Perhaps the plum and apricot form the exception to this rule, for in some of their varieties, they do finely worked on the peach. Then for dwarfing purposes, other stocks are employed, as the pear worked on the quince, apple on the paradise root, etc. You understand, then, that the reason we bud or graft the seedling tree, is, that the top or the fruit bearing portion of the tree, may be of the desired variety. Now these operations of budding and grafting, though quite different, produce exactly the same results, and as far as the tree is concerned, there is no advantage in the one over the other. It is only a matter of convenience to the nurseryman; so do not be misled on that point. I may say, further, that the stone fruits, as the peach, plum, apricot, and also the pear, are not so successfully grafted as is the apple, and for this reason they are usually budded, while the apple is, as a rule, grafted. For this grafting of the apple, until quite recently, it was the aim of the nurseryman to grow the seedlings with roots as long and smooth as possible; then these roots were cut into sections about four inches in length, and a scion grafted into the top end of each piece. This practice is at present generally condemned, and all nurserymen who are up to the times, now use a whole, shorter, branched root, for one scion. This, then, is what is meant by whole and piece root trees. In the case of the whole root tree, we have a perfectly rooted tree, with all the different roots as nature designed them to be; that is, with the heart roots and the stout side brace roots, all on the same tree. In the piece root tree, we never get both these sets of roots in the same tree, and the result is a tree that will lean over more or less, or go entirely down before it is very large.

All enterprising nurserymen of the present day use the whole root plan. This seedling, or root grafting, we do in the winter, at the fireside. We use what is called the tongued splice graft, and wrap the splice with waxed thread. No other wax is used. These little grafted trees are then packed in sand, and kept in a cool cellar till spring, when they are planted out in the nursery rows, one by four feet. Here they are carefully cultivated, trained and pruned, for from two to four years, when they are ready for the planter, and are sold, in these depressed times, at from ten to fifteen cents apiece. The seedlings of the pear, cherry and plum, are planted out in the nursery rows early in the spring, and budded near the surface of the ground, during the following July or August. These are cared for even more closely than are the apples, for two or three years, and are then for sale at from fifteen to twenty-five cents each. These are the methods in most common use, although some of our stock has to be grown by cuttings, some by layers, others from root cuttings; and still others, like some of the evergreens, from the seeds, and be protected from the sunshine for two years. Some of these operations, especially budding and grafting, every farmer should understand. Then you could easily transform that worthless tree into one of value. Then that neighbor, who has so much better fruit than you have, would gladly give you scions or buds with which you might retop some of your trees which bear inferior fruits. Ladies, you would be delighted with the effect you can produce by budding several colors of roses upon some choice rose bush. Let me say right here that even at the risk of your stealing my trade, I shall be only too glad to show any one just how to perform either of these operations, to-day or any other time.

The questions are so often asked me, when to cut scions, when to graft, how to make grafting wax, etc., that I shall answer them here. Scions are the better to be cut before they are frozen much; early in December is the best time. They must be packed with their cut ends in damp sand, and kept in a cool cellar till wanted. The time to set the grafts, is in April or May, just as the buds on the tree to be grafted are starting vigorously. A warm day should be chosen for the work.

The best grafting wax is made as follows:

Rosin, four pounds; beeswax, one pound; linseed oil, (boiled), 1 pint; melt all together and pull like taffy.

The question is often asked, which is the better time for planting trees, fall or spring? It is the almost universal opinion of experienced planters that fall is the better time, as trees planted then have a better chance to become fixed and started before the hot weather tries them. Spring planting is all right if not deferred till too late in the season. Don't wait for any particular date, but as soon as your ground will work with a good degree of fineness, go at it; even if such a chance presents itself in March, improve it. Don't put it off until the buds are half out, and then expect success. Dig the holes large; set the trees as deep, or a little deeper, than they stood in the nursery; fill in with the fine surface soil, being careful to fill between all the roots, leaving the roots in their natural positions; make this filling as firm as possible. If the season is dry, and you wish to insure the tree, it will be well to give it a pail of water before the filling is finished; but don't tramp the after filling. After growth has begun, the surface of the soil around the tree should be frequently loosened with the hoe, and not allowed to sod over.

I am often asked, what about planting in the moon? Well, I know how far the moon is from us, how large it is, and I know that its attraction upon the earth in part, causes the tides. I also know that every storm that ever visited the earth, and every change of the weather that ever occurred, came exactly at the time of the "change" of the moon, for it changes every second. But I don't know anything about its influence as related to the tree business. If you can get any advantage by consulting it do so, but don't thank me for it.

It is a very good thing to get your trees a week or so before you wish to plant them. You can then heel them in and plant them at the first favorable time. In buying trees remember that peach trees should never be more than one year old, four to six feet high. Trim off all limbs, and cut back the stem to three or three and one-half feet. Apple, pear and cherry trees should be from two to three years old. In selecting trees chose such as are thrifty, and not forked. When planting, prune out all superfluous limbs, and cut back last year's growth one-half, leaving the *last bud on the outside*; this will spread the top. Now, lest I weary you, and you get some of these directions mixed, I will close, for I would not have you do with these hints as a customer of ours did, who bought a lot of asparagus plants. He asked me to tell him how to plant them. I told him to dig a trench two feet wide, and as deep; to fill it to within four inches of the top, with good compost, then set the plants on this, and fill with four inches of fine soil. He came back the next season, saying that everything grew but the asparagus; that he had followed my directions to the letter, and that not a single plant grew. That was a stumper for me, but I asked him what my directions were. He repeated them verbatim, except that he reversed the order of filling the trench. He put the four inches of fine soil in the bottom of the trench, then set the plants, and filled with the twenty inches of compost on top of the plants.

But let me add one or two suggestions concerning your selection of varieties. If you are not well informed in the varieties, any wide awake nurseryman can make a better selection for you than you are likely to make for yourself. And as for the seemingly desirable wonders offered you by the avaricious tree tramp, which you really would like to try, you would do well to submit the list to your nursery-

man for his advice. If you lack confidence in him, send your list to our mutual friend, Prof. W. J. Green, of the Experiment Station at Wooster. I promise you it will save your money as well as your temper.

THE DRAFT HORSE.

By R. W. DUNLAP.

Read at the Farmers' Institute held at Tarlton, Pickaway County, January 20 and 21, 1897.]

No doubt there are a few men in this audience who have very recently asked themselves whether or not it will pay them to continue raising horses at the present prices. Perhaps many of you think that to continue this branch of farming and be compelled to sell fully matured horses for fifty dollars and seventy-five dollars is not economic thing to do.

Just now, particularly, when electricity is finding such manifold uses and the bicycle is being used by thousands of men and women, we are told that the horse industry has been permanently impaired; forgetting that the farmers of England made the same claim when its first locomotive was used some sixty years ago. They said there would be no further use for horses, and that the price of oats would fall so low that the business of farming would be ruined. And forgetting also that statistics show us during the past ten years that the number of horses has increased 44 per cent., a very much larger increase than has occurred in any other class of domestic animals, or with any other of our staple farm products.

If, to-day, in the city of Chicago or any other large distributing center, the horses should be stricken universally with some disease, as was the case in the same city in 1872, there would be a greater stagnation in business than occurred during the last strike.

Our professional fast horse friends, like the politicians, are ever anxious about the farmer; they cry with alarm, "You will soon overdo this draft horse business." That was their kindly warning back in 1870, when horses were imported by the dozen for the purpose of building up and getting a better class of draft horses in this country; but the popularity of these horses so increased, that in 1880 we were importing them by the hundred. The continued demand for larger and heavier horses, and more of them, completely dispelled the idea of overdoing the business. The importation of Old Louis Napoleon from France in 1851 and his successors in 1868, was met by prejudice and jeers, but they finally proved their usefulness and superiority. Then came the Clydesdales from Scotland, followed in a few years by the Shires from England and more recently by the Suffolks and Belgians. At first the French horses were called Normans and the French grades are still called Normans in large cities, where the clean legged, dapple grays are great favorites.

The American draft horse is thus being rapidly developed from the blood of the several draft breeds so liberally imported from Europe. American skill, climate and feed, with the abundant supply of all the best breeds of Europe upon our American foundation, are already developing flattering results; and I believe the time is not far distant when the American draft horse will attract the admiration of European cities, for he will have size, strength and style with American snap and vigor. Then instead of the United States receiving importations, she will be an exporter of the best horses of the world. America leads the world in progressive improvements, and why should she not raise as good if not better draft horses than any other country in the world?

There may be, and I am quite sure there is, an over supply of horses in the United States at present. That is, there is an over supply of the common class of horses and also of the scrubs. But by no means is there an over supply of good draft horses—horses that will weigh one thousand six hundred to one thousand eight hundred pounds, good form, good feet and good action. Horses of this kind will sell to-day in the Chicago markets for from one hundred and fifty dollars to two hundred dollars.

The city merchants and manufacturers have found that the heavy grade draft horses last longer and do more work, hence they readily pay higher prices for them, and are eager to get the finest large horses to be had. Then the best sell first at the highest price. They do not ask that they be cheap, but they must be large and fine. We should not expect with light draft horses to get large prices. Success in this day and age is won by intelligence and skill to breed what the markets require, increased size with good all-round quality.

The markets do not require any more common horses and scrubs at present; so if we wish to succeed we should raise what the markets demand.

The care and management of draft horses is not materially different from that of others; give them good clean feed and water regularly, and they will seldom miss a meal or be out of condition. If stabled, give them clean hard floors to keep their feet sound. The French generally have cement, stone or brick floors, with good bedding at night. They water their horses before feeding, give salt regularly, either in the feed every day or keep a lump in the feed box, and where horses are stabled have good ventilation. Pure air next to pure water is essential for raising good stock of any kind.

Before bringing this paper to a close I thought it might be of interest, to some of you at least, to hear something about animal mechanism and conformation. How it is that one horse of a certain height and weight and of a certain degree of soundness is better than another horse of the *same* height, weight and degree of soundness, or in other words on what we base our judgment in deciding which of the two horses is the better. I am well aware of the fact that a person cannot become an expert judge of a horse by the facts I am going to present, or by *any* amount of study or book knowledge he may acquire. Nothing will take the place of artistic instinct and actual practice in judging animal conformation. However, I do believe there are some elementary principles which can be readily learned that will greatly aid the artistic instinct and very greatly help in obtaining practical experience in judging.

For example, it will greatly aid the student of horse flesh to know that in horses of perfect conformation or make-up, the height of the head bears certain relations to other parts. The height of the horse at the withers, and at the croup, is almost exactly two and one-half times the length of the horse's head, and varies but very little from this in any horse of good conformation. The top of the head when well carried is three heads in length from the ground. The length of the neck is equal to the length of the head, while the greatest width of the head when viewed from the side is one-half its length.

The distance from the point of the withers to the point of the shoulder, the distance from the back to lower border of the abdomen, the distance from the rear border of the shoulder blade to the hip is the *same* length as that of the head, although the last measurement in most horses which I have measured is somewhat greater than this. However, a horse that we consider well proportioned will have this length.

The second measurement, the measurement from the back to the lower part of the abdomen is of greatest importance. This measures the depth of the body. And as the body contains the organs which are most essential to life, such as the heart, the lungs and the digestive apparatus, it ought not be deficient, since these

organs are precisely those from which the animal machine draws its power and resistance. An animal which has a weak chest, and a small abdomen, will be without strength, without wind, capable of very little exertion. Such an animal will be a poor feeder and will not last long. The body of a horse of good conformation should extend several finger breadth's below the elbow, the ribs should be round, the chest widened behind and head wide in its middlepart, and the abdomen should be full and quite cylindrical.

It is also an interesting fact that the distance from the point of the shoulder to the point of the buttock or quarter is the same distance, in many horses, as the height at the withers or the croup, and hence this distance is two and one-half times the length of the head. I might thus go on giving other measurements and requisites for a good draft horse, but time will not allow me to do so. Enough has been given to show the possibility of good results in this line. I simply wish to show in these few remarks on conformation, the fact that a knowledge of the proportions of different parts of a horse will enable one to much more readily appreciate by means of the eye alone, what is the proper make up for a good horse.

To succeed in the draft horse business, as in any other business, it is necessary to devote some time and study to it. Think how many farmers to-day are raising horses, that if sold now would not pay for a year's keep. Those farmers, I venture to say, do not lose much sleep in studying the markets, neither do they spend much time in trying to find out what should be the conformation of horses for different purposes.

No successful merchant would ever think of buying merchandise that there was no demand for. Yet many farmers will persist in raising horses that there is no use or demand for, force them upon the market, and the consequence is they bring a very low price.

The man in the draft horse business who studies the market as well as the horse, raises the kind of horses there is a demand for, has been successful in the past, is succeeding at the present, and I believe will succeed in the future.

SOME ANATOMICAL PECULIARITIES OF THE HORSE.

By S. R. HOWARD, V. S., Hillsboro, O.

[Read at the Farmers' Institute held at Hillsboro, Highland county, Feb. 19 and 20, 1896.]

Many and remarkable are the anatomical peculiarities of the horse; and in this respect he differs but slightly from other animals, which all possess more or less peculiarity of structure. I will endeavor to describe in as concise a way as I can a few of these odd features—there are hundreds of others about him, but I shall only mention a few.

Microscopically considered, the structure and development of the bones of the horse are identical with those of man. His ribs number eighteen on each side, although occasionally he has more. I remember having seen a mule that had thirty-eight well developed ribs, nineteen on each side. The number of molar teeth is given as twenty-four, but I have seen twenty-eight well developed, perfect grinders doing duty. The skull bones, excluding the teeth and bones of the ear, are thirty-eight in number. The bones of a colt's head at foaling time are disarticulated. These, of course, become united in the adult. The skull of man and the skull of the horse are composed of exactly the same number of bones, having the same general arrangement and relation to each other—not only the individual bones, but the

very ridges and surfaces for the attachment of muscles, and every hole for the passage of artery or nerve, seen in one can be traced in the other. We find in the adult male horse, midway between the grinders and the incisors, the four canine teeth. Occasionally they are seen well developed in the mare, but usually in her they are rudimentary, are often shed and never replaced. All mares, however, have the germs of them in the chambers of the jaws, and they appear in the majority of old mares. Some authorities claim they have known of these canine teeth in the male to be shed and replaced, but as a rule these teeth appear only in the male horse and are permanent from the time of their first appearance. While these teeth distinguish the sex, their loss would not be felt on that account. If Darwin is correct, these tusks are in the course of ultimate extinction. There is more or less mystery about these tusks, yet they are important factors in the consideration of the problem of the evolution of the horse as well as of other animals. Perhaps in the long ago these teeth served him as weapons of offense and defense.

The supercarpal bone of the knee is a very singular bone, considering location and shape. To some it may appear very odd and perhaps almost unnecessary. It is a very important structure, however, as it is the lever bone of this joint. Its development and position are points of great interest and importance in the consideration of action and speed. This is especially true when the limb is well shaped and the animal under examination is bred for speed or stylish action. In the human hand there is a small bone called the trapezium which articulates with the bones proper to the thumb and the index finger. There is frequently found in the knees of large, common bred horses one or two small supernumerary bones, usually only one. This bone is the analogue of the trapezium of man, and when two of them are present they represent the thumb and index finger of the human hand.

One of the horse's hip ligaments is especially peculiar to him, no other domestic animal possessing it. It arises from the head of the femur, or thigh bone, and passes along a groove on the under side of the pelvis, meeting and crossing its fellow at the middle and continuing to the muscles on the other side. Thus the thigh is partially supported in position by the muscles of the opposite side. The absence of this ligament enables the larger ruminants to deliver those sidelong, sweeping blows, popularly known as "cow kicks," while the horse in kicking is compelled, owing to the presence of this ligament, to kick in a straight line backward.

Did you ever attempt to lift the head of a horse after it had been severed from the neck? If not, you can hardly realize how much weight is suspended at the end of the column of bones of the neck, not to mention the weight of the neck itself. There being but a single column of bones to support this immense weight, and they being in a position approaching the horizontal, we can readily see there must be something of immense strength and elasticity to support this great weight and leverage. The muscles could not do this, for they would soon become exhausted, and if there was nothing else to hold the head up it would soon fall to the ground. What a spectacle the horse would then present! I have seen several cases where the head could not be raised from the feet or off the ground, and these animals were pitiable objects indeed. There is a large, flattened, elastic cord that extends from the head to the spines of the withers, continues back on the tops of the backbones and is attached to them throughout the length of the spinal column. This cord forms the upper border of the neck, and sends down to the bones of the neck a very strong sheet of similar elastic tissue. The head, then, while the horse is in a state of rest, is supported by this ligament, without any aid from muscular energy. This ligament differs from any ligament around a joint. It is elastic; a joint could not have elastic ligaments. While grazing the head is drawn to the ground and elevated again by very little muscular energy. Of course most animals have this structure more or less developed, but I know of no animal in which it is so largely developed as in our subject. In man, in whom the head is supported by the spinal

column, this ligament is very rudimentary and is not elastic. It is a beautiful and wonderful structure in the horse. When he is grazing it is fully two inches longer than when the head is erect. Think of the leverage the head and neck of a two thousand-pound horse would require! I daresay there are plenty of men in this world that could not lift from the ground the combined weight of the head and neck of so large a horse. This great weight is constantly supported by this odd-shaped ligament.

I said man also had this structure, but that in him it was rudimentary. Conversely, the horse has many structures that man correspondingly possesses, but often in the equine they are very slightly developed, if at all. There is not a person living that has not many rudimentary muscles, bones and appendages that are entirely useless. What their uses were ages ago is now involved in speculation. These same immature structures can be found well developed in some of the lower animals. There are several interesting rudimentary muscles of the horse (the *interossei* and *lumbricales*) that lie along the tendons of both fore and hind limbs, below the knee and hock. They are of small and variable size and frequently they contain only a little muscular tissue, but now and then a subject is met with in which it is distinct. They are extremely rudimentary, having a very small, fleshy body and a long, fine tendon. One set of these are the representatives of the muscles which in the human hand fill up between the bones of the body of the hand and give lateral movement to the fingers. The minute size of these muscles prevents them having any effect on the movement of the limbs of the horse. These muscles are, in fact, perfectly useless, but they and other rudimentary appendages are of great interest to comparative anatomists.

The soft palate of the horse is a most remarkable structure and is not like the palate of any animal I know of. It is a valvular curtain suspended at the back of the mouth. In this valvular partition is the posterior opening of the mouth, through which all food and water pass on their way to the stomach. The valve of the windpipe (the *epiglottis*) covers the opening and rests upon this curtain from behind. This valve is always in this position save when the animal is swallowing; then it is folded back and covers and closes the wind-pipe. Owing to the large size of this curtain, the small size of the opening in it and the covering of this aperture by the valve of the windpipe, the horse cannot breathe through his mouth nor vomit through the same. Hence the great danger in persons, not familiar with the structure of the throat, giving medicine to horses. They are often as liable to get the medicine into the windpipe as into the stomach, and then the last condition is worse than the first. Never under any circumstances drench a horse through the nostril.

When a horse is once squarely on his feet and at rest, there is special stress brought upon certain unyielding tendonous structures of particular muscles, thus acting as ligaments and supporting the bones of the limbs in their relative positions to one another. This wonderfully ingenious arrangement might be compared to the adjustment of joint and tendon in perching birds that enables them to "roost." In such birds, when their limbs are flexed their toes are flexed perforce. Hence during sleep, when the weight of the bird flexes the knee joint, the toes are forced to clasp the perch. I should not wonder if most of those who read this have not lately dissected one or more thighs of that great American bird, the turkey. Those who have will of course have noticed the ossified or bonelike tendons present in the muscles of the leg. This transformation of fibrous tissue of muscle into bone is not the effect of old age nor senile decay, for it is noticed in very young animals. There are unyielding tendonous structures that help to sustain the great weight of the body of the horse that are similar in arrangement and organization to those referred to, only they never become ossified or bony in health. Some horses are much stronger than others in this regard. This explains how it is that a horse can stand and sleep. We all know some horses lie down very little. I know a good mare that

stood five long months in a swing without once lying down or getting out of it. She became very fat, recovered from her disease and became as nimble as she was before.

The digestive tract of the horse differs widely from that of other animals in many particulars. Measuring from end to end of the digestive apparatus of the average sized horse, it is found to be about one hundred feet in length. The esophagus is remarkable for several things: First, the abrupt manner in which it enters the stomach, hardly dilating at all before doing so; second, the enormous proportionate size of its lining membrane. This is so large that near the stomach its folds completely fill the tube, thus assisting in preventing the regurgitation of food. Vomiting in the horse seldom occurs unless disease has wrought some structural change. I have known of several otherwise good horses that were continually changing owners among gypsies because they frequently vomited. If these horses were fed and then allowed to put their heads down to their knees, or lower, the entire meal would come up; but if their heads were tied up for an hour or more after eating they would retain and digest their ration. These horses if allowed their liberty would have soon starved to death, but if attended to regularly seemed in good spirits and apparently able to do road work. They had to be fed from off something at least as high as their breasts, and then their heads tied up a little higher. I have never been able to get the history of either of these unfortunate animals or had the pleasure of dissecting either of them, so I cannot tell what change had taken place that allowed such peculiar phenomena.

The stomach of the horse is very small in proportion to his size. It holds on an average about three and one-half gallons. The lining is the most remarkable thing about it. This mucous coat is divided very markedly into right and left portions. The left is thick and tough, white in color, and resembles the lining of the esophagus, of which it is a continuation. Digestion proper does not take place in this left portion of the stomach, because here there is no secretion of the gastric juice. The right section of the stomach is the true digestive portion and is similar to that of the human in appearance. The horse's stomach, viewed externally, resembles a simple stomach; but an internal examination reveals it to be a compound organ. To get all the nutriment out of oats they should be digested slowly, and this can only be properly done in the stomach. As soon as any kind of food enters the stomach of the horse, it is rapidly pushed into the intestines by food that follows, but toward the end of the meal the sojourn of the food is prolonged and gastric digestion is, therefore, then more perfect. It will thus be understood that the constituents of a horse's meal are not retained in his stomach until gastric digestion is completed. This is on account of the comparatively small size of his stomach. He cannot distend his stomach, as his intelligent master sometimes does, until it may virtually fill his entire abdomen. Experience has shown that if oats are given first, subsequent eating of hay forces the oats into the intestines before their digestion is completed; while if oats are given after hay, they properly stay in the stomach much longer, while the hay, containing a smaller amount of nutriment may be partially digested in the stomach and its subsequent changes completed in the intestines, where digestion is slow. Therefore oats should be given after hay, and you all know water should be given before hay, both for one and the same reason.

Veterinary surgeons are often asked the indefinite question, "Has the horse a gall?" Gall, properly speaking, is the fluid secreted by the liver, and the presence of it in the intestine is absolutely necessary to all animals for the perfect digestion of their food. What is usually meant by the question is, "Has the horse a gall bladder?" He has no such organ. Many, who know this, think the horse is the only animal destitute in this respect, and that he is the only animal in which the bile from the liver pours directly into the intestine through the tube called the gall duct. The gall bladder is a dilation of this tube, and is absent in the horse, the mule, the

ass; among the ruminants in the stag, camel and dromedary; in the elephant, rhinoceros, tapir and wild boar; while in the birds it is absent in the pigeon, cuckoo, parakeet and ostrich. It is also absent in the mouse and marmot.

There is a peculiar anatomical feature of the horse's liver, namely, the persistence, throughout life, of several veins leading directly from the veins of the stomach and intestines (portal veins) into the posterior vena cava and heart. This condition, common to unborn mammals, continues among our domestic animals in solipeds only. In all other animals the portal vein has no communication with the vena cava except through the capillaries of the liver. Thus considerable rich, crude blood coming from the intestines is drawn at once into the general circulation unchanged by the circulation of the liver and chemical changes therein effected. This condition of the blood is said to produce a certain disease under some circumstances, viz., azoturia.

The structure of the lungs of the horse differs in certain respects from that of most animals. You no doubt have noticed that the lungs of animals are divided into lobes. These lobes are divided into smaller lobes or lobules, and these latter are connected together by the tissues proper of the lungs. This lobular division is constant in all animals that suckle their young, but in the horse it is less distinct than in many of our animals, for instance, cattle. In the lungs of the latter animals you can see with the naked eye the division of the lobules. This difference in the structure of the lungs of cattle and horses is one reason why the horse is more apt than many other animals to die from lung diseases. There are other reasons accounting for the great fatality among horses from lung diseases, but this is the only one owing to the anatomical peculiarity of the lungs. In all domestic mammals the right and left side of the chest are distinct and separate, but in the horse alone there are several openings (mediastinal) from one side to the other, so if the horse, ass or mule has on one side an effusion of water in the chest from pleurisy, the fluid can flow from that side to the other. Strange to say, during foetal life these openings are closed. As soon as a colt is foaled these openings appear, this being one of the many changes that occur during this all important "event" in a colt's life.

The red color of blood is caused by the presence of myriads of microscopic discs (corpuscles) of red color, these discs varying in size in different animals. In the human they measure 1-3200 of an inch in diameter; in the horse they are much smaller, being 1-4000 of an inch in diameter, and are every bit as delicate and sensitive as the corresponding corpuscles in man.

Few animals have skin as sensitive as the horse, especially if he is well groomed and artificially protected. Few animals perspire as freely and as much as the horse. Of the eight parts taken into his system, two leave by the skin. The large quantity of pigment found in his skin is believed to serve as a protection against the heat of the sun. Peculiar excrescences appear on the skin of the horse on the inside of the forearm and upon the inside of the hind leg near the hock. These objects, ergots or chestnuts, the "Chatignes" of the French authors, according to Chauveau, "represent the vestige of the thumb." Occasionally they are absent. There is nothing in them of special interest, yet to an inquiring mind nothing is beneath notice. They are absent from the hind limbs of the mule, the ass and horses of some oriental countries that are descendants of the African horse, which of all equine races is the most closely related to the ass. These ergots are very small and are sometimes absent on well bred horses.

Immediately within the margin of the upper part of the nostril is a structure of very considerable interest, which is generally supposed to be peculiar to the horse, and the use of which is entirely unknown. It is a blind pouch three or four inches in depth, conical in form, slightly curved, and communicates with the nasal cavity freely below. This is called the "false nostril." Insert your finger into a

horse's nostril at the inner angle and usually you will find your finger in this cavity. In the ass this pouch is deeper, and in the tapir a similar structure is found, only in a very much more developed condition. It may be interesting to mention that the tapir is the only animal now in existence that very closely resembles the horse; but it has become almost extinct. It is obvious that the "false nostril" of the horse cannot be looked upon as anything specially belonging to the economy of that animal, but rather a survival of the structure which was more highly developed in certain primitive animals. Several years ago it was discovered by some gentleman in London that the rhinoceros had a similar nasal pouch. The horse, tapir and rhinoceros are the only known animals possessing this false nostril. Other equally mysterious structures are the "guttural pouches"—also diverticula of the respiratory passages—large membranous cavities containing only air, one on each side, situated beneath the base of the skull, and connected with the tubes of the ears (Eustachian), of which they are only dilations. The capacity of each pouch is, generally speaking, about one pint, but often it is much more. Their use is so far unknown. The most approved works on veterinary anatomy say these pouches are found only in the horse, ass and mule. There are several theories as to their use, but our space will not allow theorizing.

Since instantaneous photography has been invented the motion of the horse has received a wonderful amount of attention. Let me ask my readers: Did you ever notice how a horse walks backward? I daresay you have not. Notice one the next time you have an opportunity. You have all seen many instantaneous photographic reproductions of horses in motion, but of none in the act of walking backwards. At least I have never seen one of that kind. How does a horse walk backward? In walking backward his head and neck are elevated, the back made rigid, the fore feet pointed well under the body and the flexed hind legs push the body backward. It is the only gait of the horse in which three of the feet are on the ground all the time. Walking backward is therefore very slowly accomplished. In this act the centre of gravity is not moved directly backward, but oscillates from side to side.

These points of interest I have collected from observation in my profession and by reference to the works of standard authors. I therefore trust I will not be compared to the good M. D. who boasted to Sir Henry Halford of having been the first man to discover Asiatic cholera and to communicate it to the public. In conclusion I will quote this sentiment uttered by Lord Herbert:

"Whoever considers the study of anatomy I believe will never be an atheist; the frame of the body and the coherence of its parts being so strange and paradoxical that I consider it to be the greatest miracle of nature."

MANAGEMENT OF CATTLE ON THE FARM.

By J. A. GILMORE, Old Fort, O.

[Read at the Farmers' Institute held at Greenspring, Seneca county, January 25 and 26, 1897.]

This is called an age of inventions, improvements reforms and progress. Those who have lived half a century and kept their eyes open must admit that they have witnessed great improvements in the science of agriculture the foundation of all sciences. Yet there is still room for improvement in every department of agriculture. In presenting this short paper on Farm Management of Cattle, I do not expect to be able to advance any new methods or thoughts, but simply jog your memory upon a few facts with which you are already quite familiar. It is a lamentable fact

that we as farmers fail to do as well as we know how to do. In this matter the majority of farmers are too fearful of incurring a little expense in procuring the best breed of animals and, to save a few dimes in the first outlay, they go on year after year breeding scalawags that a wise farmer would not harbor on his farm, and thus lose dollars that might have been made if they had been willing to spend a trifling sum at first for better stock.

The selection of proper breeding stock is a subject upon which we cannot be too well informed. The individual merit of an animal often fails to be reliable; it is all very well so far as it goes, but unless something is known about its breeding or ancestors it is very easy to be deceived.

A fine looking male or female may breed the most unlikely calf, and right here comes in a point that is almost as deceptive as judging an animal wholly on its individual merits; the young calf may not give any sure indication of what it will finally develop into. A scrawny looking calf may develop into one of the most beautiful and valuable of animals, while on the other hand an admirably well proportioned, good looking calf may grow up to be an object of sore disappointment; instead of preserving its regular proportions, it may fill out in a most unaccountable manner and become angular and ill shaped. Here you can see that apparent individual merit again fails to be a reliable guide to select by; animal pedigree here gets in its most important work, revealing to the breeder qualities of the parents of his stock, to a certain degree; a finger board portraying the characteristics and history of the animals that have gone before, whose blood he has within his herd.

Professional breeders are supposed to thoroughly understand how to get cattle up in good condition and equally well how to keep them there. Seeing cattle in such hands the young buyer is liable to have his expectations raised above a reasonable point, and animals bought by him and removed to different associations, receiving different feed and less care, are sure to fall off in condition. There is nothing under the sun more certain than that if the novice buys a young animal that has been highly bred and fed, takes it home and gives it its liberty among other cattle, whether upon grass or not, there will be more or less marked change in condition, nor will he be required to wait long for this. Nothing is more damaging to the hopes of a beginner than to have expensive young animals shrink on his hands and nothing is more unnecessary if he gives them proper care and attention.

No animals appreciate good and kind treatment more than cattle. Naturally gentle, it is only by neglect they acquire habits harmful to themselves and annoying to their owners.

In the fall season when young cattle are for the first time brought into closer relations with the owner or keeper, it is of great importance to employ kindness and gentleness, always keeping well in mind that to control stock successfully you must first learn to control yourself.

Pure blood, full blood and thoroughbred all mean the same thing and indicate animals of a distinct and well defined breed, without the admixture of other blood. A grade is produced by breeding together an animal that belongs to a distinct breed and one that does not, a native, as they are frequently termed. A crossbred animal is one resulting from the breeding together of two distinct breeds. When closely related animals are bred, it is termed close breeding; and when this relationship is of the closest kind it is styled in and in breeding. A short general rule for ascertaining the amount of pure blood in any cross is to take one-half of the sum of pure blood in both sire and dam.

There are some farmers who think by crossing they can produce a better animal than the breeder who has given years of study and experience in the improvement of a certain breed. It is true, that scrubs of any breed may be improved by the introduction of better males, even from a different breed, but it is a false idea some farmers have that they can produce a better animal by the crossing of two high bred

animals. Any breed, bred for a special purpose and bred properly, cannot be improved simply by the introduction of a different breed. My advice to such would be, select the breed that suits your taste and object best, and when you get a start of good stock, breed in one line, cull closely and keep the good ones, and then resolve to grow no more of the scrubby kind.

Good common sense is a factor not to be ignored in breeding and management of cattle on the farm. To know what to do and when to do it to the best advantage require the highest order of common sense. A learned man once said, and that too with not a little show of truth, that common sense is the rarest of all senses. There are many reasons for this being true. The tendency is to an unequal balance in breeding. To know what to expect from the agencies used and when to expect it requires the very highest degree of judgment in so complicated a business as breeding. The refined breeds of farm stock are only within the reach of those men who possess a full measure of common sense which, when brought to bear in breeding, makes success easy, because it takes into account all the requirements that give value for the particular purpose for which the animal is bred. Plans for breeding intelligently have come to men step by step. A judgment well matured will tell any man that in order to be able regularly to transmit desirable qualities and form, the parents and their ancestors must be full of those qualities sought for.

We must also learn the practical value of that early maturity and superior quality that gives the top prices. It has advanced from an art to a science; art asks how, science asks why. Every farmer needs a first class male just as badly as the breeder of pure blood cattle. The breeding and individuality is just as essential to the farmer who breeds for market as for the fancier. The latter breeds profit qualities into the animal, and the market breeder should not be slow to recognize this fact. No farmer should pay a good round price for a breeding animal and then depend upon blood to do all the rest.

The importance of giving proper shelter to your cattle cannot be too strongly urged. Looked at simply in the view of dollars and cents, it does not pay to have the cattle left out of doors in the piercing winter winds. The animal heat must be kept up so long as life lasts, and to do this either a larger amount of fuel must be consumed or the fire will be fed by accumulated or stored up fuel in the form of flesh, and the animal grows poorer. It is cheaper by all means to keep up the animal heat by good shelter than by food. A shivering, suffering animal is not a profitable one; there is also an appeal to the human side of our nature in this lack of comfort. Provide good shelter from the weather for all farm animals and it pays in more ways than one.

To successfully accomplish these ends we must have stock that will respond to the demands to which we shall dedicate them. The field is a very broad one and the standard of measure an incline that tends upward and he who forgets the injunction to breed and feed wisely must fall, because he is too stupid to observe and learn.

CATTLE RAISING FOR BEEF.

By LUCIUS CROSS, Racine, O.

[Read at the Farmers' Institute held at Chester, Meigs county, December 2 and 3, 1896.]

This subject is at present rather a hard one to write upon, as the cattle business has been practically destroyed, first, by the development of cheap lands in the great West which is particularly adapted to the grazing of cattle; second, by the adverse

legislation in letting cattle come into the United States from Mexico and Canada with but a small ad valorem tax, and third, by the disregard of the reciprocity treaty with Germany, France and other European countries which resulted in the exclusion of our meat products from those countries thereby reducing our exports of cattle and hogs about forty per cent. to those great consuming countries.

To raise cattle successfully for beef, the first thing is to procure good stock to breed from. A very important part of this industry is to handle the calves right the first year. I long ago came to the conclusion that it does not pay to milk a cow and pour the milk into a vessel for the calf to drink, or to set it in pans, take off the cream and feed the skim milk. Neither does it pay to let a calf run with the cow. The first thing to do with a calf is to separate it from its mother. The next thing is to find a mate for it. Put two calves to a cow. The next thing not to do is to turn the cow in to the calves, but turn the calves out to the cow twice a day. This gives you a chance to put some bran in a trough in the calf lot to which the calves will run on being turned back into the lot or stable. This mode is an advantage in two ways; it trains the calf to driving and handling, and also remedies the pernicious habit of sucking ears, which is so detrimental to growth. The calf should be so treated till about five months old and should be weaned (if a spring calf) while there is some grass, and the feeding of grain continued till the following spring. You can then turn out to pasture without grain feed and with little care. For salting I prefer rock salt thrown out on the pasture so the cattle can have free access to it. There is one evil connected with this method of salting—the cattle are inclined to get wild.

As regards the management of the pastures, the most satisfactory way is, first, to grade your cattle as to size and sex. Put into a field a bunch that you think the field will carry, and leave them in that field during the pasturing season, and be sure you do not put in too many. If the pasture grows up on them in early part of summer, so much the better when the dry season comes; later they will eat the dry grass and do well on it. The evil of changing cattle lies principally in this, that when the pasture gets short they are apt to be left too long and get very hungry, then when turned into a fresh pasture they gorge themselves so with the young, sappy grass that it produces scours. They also get in the habit of skimming or biting off the tops and then bawling for a change. I would recommend that the changes during the pasturing season be few and only because of a shortage of pasturage.

The length of the pasture season depends on the amount of range and grass. Take them off when the grass is too short for them to make a good living. A steer will do better running out on pasture, even in the months of November and December with plenty of grass, than he will to take him up and feed him hay and grain, but when taken off pasture he should be comfortably housed and well fed. It is a good plan, when there is land enough, to let a lot grow all summer with nothing on it till late in the fall; the cattle will then, with a small amount of feed, winter cheaply and come out in good shape in the spring. This method applies especially to stock cattle. Cattle intended for beef in spring should be stabled and grained all the winter season.

But to go back to the wintering of the spring calves. In feeding them grain I have found it to be a good plan to place inside of an old fashioned, rigid stanchion, a flat bottom trough, say eight or ten inches wide, and long enough to accommodate the bunch of calves you feed together. Spread your ground feed from one end of the trough to the other. They will stick their head through between the bars and eat without crowding or bunching the grain. When calves are done eating, turn the trough bottom side up and feed your rough feed on it. By this method your trough is always clean. For this class of stock I prefer light grain feed, for the reason that among stock of that age, when fed in a bunch, there will be some dainty eaters which eat slowly and sometimes not at all, and the gross eaters are apt to get

too much and are injured. Give, in addition to your grain feed, good, sweet clover hay, (no timothy), plenty of straw bedding and room enough to stir around in and you will have in the spring a nice start for good shippers.

We now come to the coming two year old, which of course must be stabled separately. I still feed in stanchion for the sake of convenience of stabling, saving of feed and economy of room—stabling six head on sixteen feet. I let each have his separate grain box, which is stationary; feed grain and hay or fodder, bed well and turn out through the day in a lot with water and straw rick in it. I also built a long, covered manger in my straw yard so that when fodder is plenty I can fill it for them to eat through the day.

Now we come to the coming three year old, which should, from the time it is two years old, always be in order for good beef till the time he is marketed, and as he grows older the feed should be such as to produce fat, and should be composed of a greater portion of corn.

I have for the last seven or eight years fed both cattle and horses on corn and cob meal, mixed with either bran or oats, and find it the cheapest and best of feed. Any one who will feed corn meal and timothy hay to young stock will be lucky if he raises any great proportion of them. Such feed always causes constipation and indigestion, which often ends the life of the calf.

And now in conclusion I wish to ask if any one since 1861 ever saw cattle scarcer or lower in price? Is it scarcity of money? I answer no. There is no scarcity of money as long as there are millions lying unemployed. "Then what is it?" you ask. You no doubt have been given some pointers during the last political campaign, but I am not going to talk politics, which is excluded from these meetings; but I am permitted to talk on any subject that affects our pocketbooks. Under the old law, cattle coming from foreign countries, small or large, good or bad, to the United States must pay a specific tax of ten dollars per head. The effect was if Mexico or Canada had a steer good enough so they could afford to pay the duty he was good enough to ship to England. Consequently he was not brought in competition with our American cattle. The poor ones could not be brought in because the owner could not afford to pay the duty. Under the present law these foreign cattle come into our country by paying a small ad valorem tax which amounts all the way from seventy-five cents to three dollars—making it possible to flood the country with inferior cattle. Each one so admitted displaces one of our better American cattle. Also the reciprocity treaty was disregarded, the result being the exclusion of many of our products, among which was our cattle.

As I look around over the hills of Meigs county I cannot help thinking it would be better for the owners to pasture more stock, thereby avoiding the wash of the land, and not all rush into wheat. And if cattle raising is given a fair show by our law makers, the time will again come when our hills will be covered with a coat of green grass and lowing herds to eat it which will be a delight to the eye and will make a bulging pocketbook for the owner.

DAIRY HELPS FOR THE FARMER.

By JAMES R. ORR, Cedarville, Ohio.

[Read at the Farmers' Institute held at Xenia, Greene county, O., January 1 and 2, 1897.]

At this time when so much dairy literature is being distributed over the country from every quarter of the land, anything I present on the subject may be but a repetition of facts already known to a number of you.

It is not to be expected that all farmers will make a specialty of this part of the farm work, or will have barns filled with dairy animals; or that all the improved dairy implements will be found on every farm. This should not be, for, were it so, we can safely say that there would be an over production followed by extremely low prices. The same results would naturally follow should we all pursue one line of farming to the exclusion of all others. There must be a diversity in farming; each one must determine for himself what shall be the one kind of work best suited to him, that for which he has a special adaption and for which he is favorably situated.

The first requisite for the dairy is the cow—the special purpose cow—the one which has proven herself capable of performing to the highest degree of perfection, this special work; the one which has for generations been bred and fed with this one object in view—dairy capacity—which, by intelligent breeding and feeding, has become so constituted that it is her very nature to convert the food given her into dairy product. Here is where many make the first and great mistake; who think they must have the general purpose cow, or rather, as she should be known, the no purpose cow. We need not expect to find two entirely different natures in one individual or animal; experience has taught us that if we are looking for the dairy animal we must find her where nature and environments have placed her.

It is claimed by those who are engaged in producing and marketing the beef breeds, that to obtain the best results it is very necessary to have one of the representative breeds especially adapted for that work, and we say they are right. The no purpose animal will no longer satisfy the wide awake beef producer; then let us be as careful to get the dairy cow for our work as the beef breeder is to have the one best suited for his work.

This special dairy animal must then conform to the dairy type. We should know our cows; trust no longer to appearance, but put each one to the real test by the use of the scales, tester and churn; have every cow prove herself and show by these methods her ability to earn her own living and leave a fair profit for us. I do not believe that the cow that fails to produce two hundred and fifty pounds of butter during the year—an average of twenty-five pounds a month for ten months—fills the requirements she should; nor could I be satisfied with our herd were they not making on an average, including the heifers, more than three hundred pounds each.

How shall we treat this special dairy animal so that she may earn her own living and leave a fair compensation for our labor? It has been said that the average cows are simply boarders at the expense of their owners; we should at once find out if the cows are to bear the responsibility of the truthfulness of this statement, or if the fault is with ourselves from failing to give our cows such treatment as will make them a source of profit instead of loss.

I have said that we should have cows capable of doing profitable dairy work, but we must remember that breed and feed are inseparable. I care not what the capabilities of the cow may be if she does not receive proper treatment and is not fed a suitable ration she cannot return to her owner apaying profit for his feed and labor. We must raise upon our own farms as great a variety of feed as we can and not depend too much on purchasing our feed, for in so doing we not only pay the cost of their production but possibly a fair profit to one or more dealers. I shall not attempt to prescribe any rule by which we should all be governed as to what feed each one should use, but we should all try to have this variety: clover, hay, oats, a liberal supply of corn fodder, corn meal, and where there are a sufficient number of cows—not less than five—it will pay to have a small silo well filled each fall, adding to the variety of feeds, to the health of the cows, and the yield of the dairy. Wheat bran can be fed to good advantage when not too high in price, but there will be less need of an outlay of cash for this where we have the silage. In our own dairy this

fail the rations for our cows have consisted of silage, whole or unground oats, a little clover hay, and a very small amount of corn. These are fed in the stables and when the weather will permit the corn fodder is fed in the feed lot. Rating the silage at two dollars per ton, oats at twelve cents per bushel, clover hay at five dollars per ton, corn fodder at ten cents a shock, corn at twenty cents per bushel (these are at or above the market values), it costs us, for each cow, fifty-five cents a week, or about eight cents a day. This, I think, is about as good a ration for winter feeding as can be had of our own production. As I said before, some bran might be added, and in case there was no clover hay, I would say feed the bran; but we have had good results from the above named feeds, which, to a great degree, makes the winter rations for our cows. In the summer season we feed at milking time a small amount of wheat bran or ground oats, and in the fall of the year these give way to field pumpkins. These, I think, are an excellent feed, and as long as they can be had are fed liberally. I believe there is no other time of the year when milk and butter can be produced at so small a cost as when pumpkins are fed in connection with pasturage.

It will be a great help to prepare a small piece of ground convenient to the place of feeding and sow it to corn as a soiling crop; no other way ever tried by us has given as much feed and filled a better place than this has done. Have the ground well prepared. Sow with the wheat drill, adjusting it as you would to sow five pecks of oats per acre, and you will have about the right amount of seed sown. Do not put off commencing to feed this too long, as you will be surprised at the length of time it will last. Should the fall pasture be dried or short, this will supply a much needed feed for the cows. We cannot be too careful as to the feeds and the manner in which they are fed; any one or all may be fed at a loss if not fed judiciously. The off flavor in butter is often produced by improper feeding by the farmer, while his wife gets the censure.

We must not only have a good supply of suitable feeds for our cows, to have them do well, but they must have a good and comfortable stable. No cow, I care not how well she may be bred and fed, unless she is well protected from the cold, can do her part of the work acceptably; she must be comfortable. The feed given is first used to maintain life and supply the wastes of the system; after these are supplied it will be returned at the pail or churn. Therefore, it will be cash in our pockets to have warm stables properly constructed so as to contribute to the comfort of the cow. To be comfortable she must be quiet, no disturbing influences should be tolerated; let her be so treated by you that she will expect kindness instead of ill treatment, so that you will be regarded as one contributing to her wants and necessities. To have a profitable cow we must have a well fed one, with comfortable surroundings and kind treatment bestowed at all times, and more especially at milking time. Be sure not to get into any controversy with her, even if she does not do her part in the most satisfactory way. If you have anything like a bad temper, if you feel angry about anything, don't give vent to your feelings and seek for satisfaction by ill treating the cow, for, rest assured, brutality thus given out will be returned to you with interest greatly compounded. Let the milking be done always by the same persons, drawing the milk as rapidly as possible in a manner agreeable to the cow.

How shall we dispose of the product of the dairy? There are two ways by which this may be done, selling it as milk and cream, or as butter. For those who are convenient to a good retail trade, the milk, retailed to the consumer, will bring more money. This, however, involves extra work and time, and they who sell all the milk are compelled to depend on others for their cows, since they are not able to raise the desired calves to keep their stock replenished. They must buy developed cows, paying good prices to obtain good ones, for good cows, as a rule, sell at high prices; but those who sell their product as butter, can, and should, raise

at a very small cost all the calves from the best cows, for in so doing they will be able to grade up the herd and have some young stock for sale to help make up the credit side of the farm account.

Whether we sell this product as milk or butter, we must have a choice article to obtain a good price. It must please three of the senses, sight, taste and smell, must be well put up in a neat and attractive form. Good reasons may be given for selling in either way. Where we do not care to raise the calves, to sell the milk at retail brings us in good returns, but requires much extra time and work, and also carries away from our farms some means of helping to profitably raise our stock. It also detracts from the fertility of our farms more than if it is sold as butter. For the majority of us, it appears to me, the best method is to sell as a finished product, aside from what may be sold at home as milk or cream, saving to us the time and expense of going more than once each week to supply our trade. That we may do this, it is very necessary to have a good butter maker. This is where the farmer's wife should have the oversight of the work. She should know how to treat the cream and make it ready for the churn. This requires special care so as not to allow it to be injured by surrounding influences while being ripened. That the cream may be ripened evenly, it should be stirred at least twice each day. Those who use the shallow pans should stir the cream in the cream buckets after each skimming. It is money well spent to have a dairy thermometer, so that there will be no guessing as to the temperature of the cream, which should be from sixty-two to sixty-four degrees. The cream from the Jersey can be churned at a lower temperature than that from other breeds. Do not try to have the churning done too hurriedly, and be sure to stop when the butter granules are about the size of wheat grains; be careful not to overwork the butter. A great deal of butter is spoiled in this way.

How shall we sell our butter? This often determines whether we shall succeed or fail. To-day's quotations at Cincinnati are as follows: "Creamery butter, twenty-one cents; choice dairy or store butter, eight cents to nine cents," a difference of thirteen cents per pound, the price of the former being about thirteen cents above cost price of producing; the latter at, or near, cost price. The cost of production, as I have shown, when the cow is a three hundred-pound cow, is about eight cents per pound, and if only capable of producing the average, as shown by the last statistics, one hundred and fifty pounds, the cost of the butter would be at least twice that amount, sixteen cents. We can readily see that to be in this business on a paying basis we must not only have a cow capable of producing three hundred pounds of butter a year, but we must be able to have a grade of butter that will sell at twenty cents or twenty-five cents per pound. Who is responsible for this low price, eight-cent butter? Experience and observation compels me to place the responsibility where it rightly belongs—with the producers. I imagine some of you will say that we have to take the price paid at the store or grocery. This is a mistake. It will require a little time and effort to work up a trade so as to sell direct to the consumers, but it will pay. I was reading only a few days since that ten milk dealers in New York city fixed the price of milk in that city, and ten thousand producers sending milk there had to take this price. You say, "how unreasonable!" no more so than for the butter makers of the majority of the farms of this county to allow the grocer to say what the price of butter shall be. I do not wish to speak disrespectfully of any of them. Very few, if any, of their number but would prefer that we sell our butter for cash to the consumer, and they in turn sell us groceries for cash. The merchant cannot well have two different prices for butter. He knows full well this plan would not be a success, so he is forced to keep the price so uniformly low that he can afford to lose a portion of it or sell it for grease. So we must work up a trade of our own, at a good price, and thus put the cows on a paying basis.

Then, in order to make the dairy pay, we must select good cows from recognized dairy breeds; feed and treat them well, and sell the butter to a regular trade.

QUALITIES OF MILK BY THE BABCOCK TEST.

By THOMAS A. CRAWFORD.

[Read at the Independent Farmers' Institute, held at Alliance, Stark county, January 27 and 28, 1897.]

When we learn that the average product of the sixteen million five hundred thousand cows in the United States is only one hundred and thirty pounds of butter each, annually, according to the last census, is it not time to be thinking how to improve in this work? There is no doubt as to there being room for improvement, as there are herds in the United States that average four hundred pounds and above per cow, annually, and herds in nearly every community in the dairy sections that average three hundred pounds per cow, annually.

These dairies should be object lessons to all dairymen. What one man or woman has done another can do, and probably a little better can be done. It is certainly well for us to try to excel in whatever line we are working. What every dairyman can do to improve his herd is to test individual cows and dispose of such as do not come up to a profitable standard. This standard will vary in different localities, depending on the cost of feed and labor, and on the value of the products, as time passes; and as the Babcock test comes into more general use, it will become more difficult to buy cows that will make a profit, as the farmers, becoming acquainted with their cows, will not sell their best ones. This is as it should be and we should be prepared to meet the gradual change that is sure to come.

What breed to select for dairy purposes I shall not undertake to tell you, only let it be some one of the special dairy purpose breeds. Study this subject thoroughly and select the breed you think best suited to your wants. Professor W. H. Caldwell, of New Hampshire, who was superintendent of the Guernsey cows in the great breed contest at the Columbian Exposition, in writing on this subject, uses the following language: "This law of natural selection applies with equal force to the dairy cow. The progressive dairyman wants a dairy cow whose lines of temperament and functions are for milk or butter, as may be desired. It does not necessitate fancy bred stock. Don't however believe I wish to raise one word against pedigreed stock. There is room for it, and it should be more generally distributed than it now is, and farmers should be more eager for its influence. My object now is to take the problem confronting the hundreds of dairymen whose conditions have not led to the same. Competition and economy are forcing them to improve their stock. This lesson of individuality should be a most encouraging one to them. They undoubtedly have many a fine, profitable dairy cow in their own herds; what is needed is to have some plan of improvement."

The Illinois Experiment Station has recently purchased cows for a dairy. The scale and Babcock tests were applied to every cow, and no cow purchased that did not promise to make three hundred pounds of butter annually. Why more dairymen do not improve their opportunity in this way I am at a loss to understand, as it takes no more to keep a good cow than a poor one.

No manufacturer could withstand the competition he has to contend with, if he left unimproved opportunities, as many dairymen are doing, in not testing and knowing what their individual cows are doing for them. With the Babcock test it is a very simple matter to tell what each cow is doing at any time, and there is no excuse for a dairyman's not knowing just where each individual cow stands. The "Hand Book of Experiment Station Work," published by the U. S. Department of Agriculture, gives the results of many interesting and instructive experiments in milking, made by the different experiment stations. It is stated that the milk from the first portion of any single milking is relatively poor,

and increases in richness to the strippings, which are relatively very rich. The milk of the same cow differs both in composition and in yield from day to day. Doctor Babcock states that the yield may vary 15 per cent. and the amount of fat as much as 50 per cent. "Our experimental work during the past year," says Doctor Babcock, "has been especially directed to these variations, and has served to indicate some causes for them which have not been given much prominence by writers upon dairy matters. It is generally considered when the farmer has supplied a sufficient amount of proper food and has provided good shelter and care for his cows, that he has done all that is possible for him to do in order to secure an abundant yield of rich milk, and the cow is usually held responsible for any failure. All of these conditions are, of course, essential for the best results, but the immediate conditions under which the milking is done appear to have almost as much influence upon the yield and quality of milk as any other factor.

"The manner of milking, the frequency with which it is done, and the time occupied in doing it may, I believe, have more influence with many cows upon the yield and quality of milk than the kind of food, so long as sufficient food is supplied. All of our experimental work indicates that temporary conditions, existing only at the time of milking, may very materially affect both the yield and quality of the milk produced. This can be most easily explained by assuming that the milk glands are most active at this time, and that the quality of the secretion depends on this activity. It seems probable that the action of the milk glands is greatly modified by the nervous condition of the animal at the time of milking.

"This experiment also brought out the fact that the manner of milking affects, the composition of the milk. It was found that cows which ordinarily gave milk with 4 and 5 per cent. of fat, respectively, gave milk with only $2\frac{7}{10}$ and $3\frac{8}{10}$, respectively, when milked one teat at a time. The milk was richer in fat when milked rapidly (three to four minutes) than when milked slowly (double that time) though the yield seemed not to be affected, the fat being, as a general rule, more sensitive to such changes than the other ingredients, or the total yield of milk."

There is at times a marked difference in the percentage of fat contained in the morning's and night's milk, mainly owing to the length of time between milkings. Milking is a trade; comparatively few dairymen realize the importance of it or the necessity for kindness, neatness, system and regularity, and of securing all of the milk.

The cow must be kindly treated at all times and in all places. It will not answer to bring her from pasture on a run with a dog behind her, and if she, in her excitement, gets into the wrong stall, don't put her out with a blow from a whip or your boot. The owner pays for this immediately in the quantity and quality of the milk from the next milking; any person who doubts this should use a scale and the Babcock test and satisfy himself.

Each cow should have her regular stall, be milked by the same milker, and at regular hours night and morning; there must be regularity in feeding, watering, salting and in all work connected with the cow.

A silo is a great help in the economical production of milk. Thousands of successful dairymen have proved this; it is no longer an experiment.

Dairy farming at high profit calls for close study all along the line. Every dairy neighborhood will show men who make nearly double the profit from the business that others do; this is a matter in which we do not need to ask our legislature for assistance, unless it is for legislation compelling us to improve our opportunities.

BUTTER MAKING.

By MRS. T. D. HACKETT, Norwalk, O.

[Read at the Independent Farmers' Institute held at Townsend Center, Huron County, February 3 and 4, 1897.]

This subject is a very important one, for the making of good butter requires more skill than any other labor the good housewife has to perform. One would think, from the many instructive articles that are written for our agricultural papers as well as the able addresses that are given us at the Farmers' Institutes, that the subject of butter making would be well nigh exhausted; but this thought presented itself to my mind when the subject was given me. Our able instructors keep a greater number of cows, and use the new methods of butter making, while we use open pans and the dash churn, as nearly all the farmers in this vicinity do. The question is, will it pay farmers with small dairies to adopt these new methods, at the present price of dairy products. I think not.

Now as to the kind of cows one ought to keep. After a number of years of trial we have decided that the Jerseys are the very best. They consume less feed, give a more uniform quantity of milk, and produce butter of a golden color. The next important feature is the feed. We feed the best of everything raised upon the farm; we have thought clover hay and good corn fodder were indispensable for making winter butter, but we never made finer butter than one winter when we fed a good quality of timothy hay. We have recently been experimenting with sorghum to help us out on dry pastures, and find it preferable to sweet corn, it keeps green until frost comes, and can be cured nicely for winter feed. We feed a grain ration all through the year; it gives a firmness to the butter that grass alone will not do. The men folks think that there has been enough said about cleanliness at the stable, but a gentle reminder occasionally works wonders. Where dry hay is fed and straw used for bedding, some fine dust will reach the milk pail with the neatest of milkers, so we strain the milk through as fine a strainer as we can procure and two thicknesses of cheese cloth. I like to have the temperature of the milk room such that the milk can remain forty-eight hours before skimming—never any longer. If we skim sooner, as is sometimes necessary in warm weather, we lose some cream. We salt the cream and stir it thoroughly each time we add to it, that it may be evenly ripened, and test it very carefully before churning. You would be surprised at the difference one or two degrees will make in the condition of the butter.

We are using the folding dash, wooden churn. The butter comes in a granular form in much less time than any other churn that we have ever tried. We rinse the butter carefully, and salt it, using one ounce to the pound. We work it over the following day cutting the butter and pressing out the moisture with the ladle, to avoid making it salvy. We like the smooth, velvety appearance of such butter much better than that which is packed directly from the churn, which has so much grain as to cause it to crumble, and enough moisture to make it streaked.

We make our butter into rolls in winter, and use jars in summer, using parchment paper and white toweling for our packages; this costs but little and adds much to their attractiveness. We sell all of our butter to private customers. Some object to this, saying it takes time to deliver, that the customers are not always at home, do not have jars ready, etc., etc. I say, be prompt in your dealings and they will soon learn to be so in theirs. Have a day to deliver it, and take it that day; the following day or the day previous will not be satisfactory; and, when the good man goes to deliver it, look a little to his appearance; do not let him go with his common working clothes on, if you do you may lose your customers. Last, but not least, do not fail to charge a good price, it will encourage you to make a fine grade of butter and your customers will be willing to pay a few cents extra, knowing they are getting a good, clean article.

SHEEP.

By BYRON G. BRADFORD, Freeman Station, O.

[Read at the Farmers' Institute held at Edinburg, Portage County, February 26 and 27, 1897.]

My subject is a broad one, embracing everything that pertains to the care of the flock.

The question is often asked, "What breed of sheep shall I get?" If several men were asked this question the answer might be different in each case; for one must consider whether wool or mutton is to be the leading factor sought, also the distance from market as well as the number to be kept. If the leading factor be mutton, choose some such grade as the Shropshire. By good care and management lambs of this breed will weigh from eighty to ninety pounds when six months old. If wool be desired then we will have to turn to the Merinos.

In our case we desire as much as possible of both wool and mutton, as we keep our fattening lambs and sheep till May 1st, and of course shear them. We find that grade ewes, running from medium to coarse, crossed by a Merino sire, produce about the best all-purpose lambs, as they produce a good sized carcass as well as an abundance of wool. With some who are favorably situated near our large cities the raising of hothouse lambs for eastern markets is quite profitable; but most of us are too far from market.

A successful man must be able to grasp the situation and cater to the demands of the consumer. For instance, just after the war the finest, shortest and heaviest wool found ready sale; now the demand is for long, fine combing wool.

Again, a few years ago, the larger the sheep or lamb the better; last year our lambs, clipped, weighed about eighty pounds and they were plenty large enough to meet the demand, selling for the highest price offered the week they were on sale. They went to New York.

When a person is ready to sell a flock of sheep or a clip of wool it is well to keep watch of the markets and when he can secure all his produce is worth, it is risky to hold for an advance, as an old friend of mine can testify. It was during the sixties, when a wool buyer went to his place, where he had a large clip, and offered him one dollar and ten cents per pound, but the man wanted one dollar and twenty-five cents, and did not sell. The next year he was offered sixty-six and two-thirds cents, but would not let it go; but the third year he sold his entire clips for three years for one-third of a dollar per pound, realizing less, for all, than he had been offered for the first clip. It is a good plan when you are offered more than anything is worth to sell; when offered less, hold.

As yet I have had no experience with soiling or the newer varieties of forage crops, but I think they will, in the not distant future, play an important part in the raising of mutton. Alfalfa seems to take the lead in certain parts of the country; but with us corn, rye, rape and sorghum are probably the best. By judicious management, these plants will form an almost continuous pasturage the entire summer.

In the raising and fattening of lambs, I think it should be the rule to give them a grain food when only a few days old. This should be bran in the beginning, supplemented by oats and corn later on. When the lambs are small, they should have free access to clover hay and grain. Then later on, in July and August, when the burning rays of the sun have dried up nearly every vestige of green, you will find that a moderate quantity of grain will help wonderfully to tide the lambs over to the period of fall rains.

Oats are well suited to provide the lambs with material for their growth, but corn is needed to fatten them. Care should be exercised in feeding corn; only a

little should be mixed with the oats at first, and the amount should be gradually increased until one-half or more is corn. At the time of year when the sheep must depend almost entirely on dry food, we find potatoes or turnips a great help, if used as an appetizer. Use salt freely, notwithstanding some writers' opinion to the contrary. Be sure that the water supply is kept perfectly fresh, as sheep are the most dainty of any of our domestic animals, readily responding to good or poor treatment, as the case may be. Years ago we thought we could not fatten sheep for market, or even feed cattle, sheep or horses through the winter without hay; but last year and year before last, our hay crop was greatly reduced on account of dry weather; but we raised between two and three thousand bushels of oats and corn; so, you see, the situation which faced us was this: feed sheep on straw and grain, or not feed at all. We decided to feed straw, and were agreeably surprised at the results, our sheep coming through in better condition than we had dared to hope; the secret in feeding straw is to feed a plenty of the right kind of grain with it.

This year our fattening sheep have not had a pound of hay, and will not for a month to come; we have a few tons of hay we are saving for April; also about two hundred bushels of small potatoes, which we will commence feeding as soon as the weather moderates, probably by March 15th.

In regard to the tick, I would say he is a hustler, and, if we keep ahead of him, we must also hustle. Some men say their flocks are not bothered with ticks, and it may be where small flocks are kept year after year the ticks can be exterminated, but, as in our case, where we often buy and sell sheep, continual vigilance is the price of subjugation. When we shear our sheep, we are careful, if the shears pass over a tick, to go back and clip him in two; of course, it takes time, but we think it pays. We prepare a dip for the lambs by boiling tobacco stems, and, as soon as a flock of sheep is shorn, we dip the lambs in the preparation, using it as warm as they can bear it. In the winter we go over our entire flock of yearlings, using insect powder, which we find is superior to snuff. We part the wool in several places, where the ticks are liable to congregate, and insert the powder, applying it from a pepper box; and now is the time that the activity of the ticks assists us, for if the powder has not reached them, they will reach it, and soon they are no more. Fifty cents' worth of insect powder is sufficient for one hundred sheep.

As I said before, we sell our sheep about May 1st, and we have found it to our advantage to shear them. The shearing is done from March 25th to April 10th, and we find the sheep gain flesh much more rapidly after being relieved of their extra covering.

We shear our sheep where they are fed, in the basement of our barn, and do the work ourselves, so, you see, we can have comfortable employment during stormy, disagreeable weather, such as often comes at that time of the year, besides saving the shearers' wages, which, on our three hundred sheep (both fat and stock) would be about twenty-five dollars.

To all those who, without any experience, contemplate joining the vast army of shepherds, I would say, go slow. There are many things to learn. In order to be successful in the management of sheep, one must have natural ability as well as years of experience. By natural ability, I mean he must be able to judge very closely on the weight of a sheep or a flock of sheep; he must be able to tell by their actions if there are any in the flock that do not feel well or are "off their feed," as the saying goes; he should take one or more good farm papers, and, by reading the experience of others, he should be able to gain much practical knowledge, for if experience only is to teach us all our lessons, there are many that will be costly ones.

Will sheep pay better in the future than they do at present? This question is of interest to all owners of sheep, and I am pleased to answer the question in the affirmative. Let us for a moment consider what regulates the price of wool and

mutton. To me it appears that the law of supply and demand is that which tells us what we will receive for our sheep and wool. The low prices of the last few years have been caused by the surplus of other countries, which, through the agency of free trade, has found an outlet in our country, driving, as it were, thousands of our sheep to an untimely end; but under the next administration, wool and mutton will be placed, as I believe, under a protective tariff, and we will receive the benefit, rather than foreign flock owners. Then sheep and wool will advance in price. More sheep will be kept. Money will circulate more freely, and, in turn, this will help to promote universal prosperity.

SHEEP HUSBANDRY.

By GEO. N. WHIPP.

[Read at the Farmers' Institute held at Centerville, Montgomery County, February 19 and 20, 1897.]

Let us consider the conditions that existed in "Sheep Husbandry" in 1892, under a protective tariff law. The number of sheep in this country was nearly fifty millions, with an aggregate value of more than one hundred and twenty-six million dollars, with a clip of nearly eight pounds of wool to the sheep and worth (right here in Washington Twp.) twenty-five cents per pound.

Let us see what effect our little political experiment cost us. By placing in power a free trade policy, our flocks were reduced more than twenty-five per cent. and the price per head was reduced more than 35 per cent. of what it was under a protective law. The same grade of ewes for which I paid four dollars per head in 1892 and 1893, I sold under the same conditions in which I bought them for two dollars and fifty cents per head in June last; and the same grade of wool for which I received twenty-five cents per pound in 1892 and 1893, I sold in 1895 and 1896 for twelve cents per pound—twenty-five cents, less the tariff, which was thirteen cents. This is what that change cost every sheep grower in the United States.

I am too much of an American to allow England and her dependencies to enrich her soil by raising sheep and exporting thirty-two million dollars' worth of wool to America, while we impoverish our lands by raising fifty-cent wheat, fifteen-cent corn and ten-cent oats to ship to England to feed their sheep. In 1893, the last year of the McKinley tariff law, there was imported something more than six million dollars' worth of wool into the United States, and the first year, 1894, of the Wilson free trade law, there was imported into the United States more than thirty-two million dollars' worth of wool; here is an excess of more than twenty-six million dollars' worth of wool that the American sheep grower was barred from growing. But I have a more hopeful outlook for the future. I believe that we need protection on wool; it is my manufactured product and I cannot compete with the producers of wool on cheap foreign lands. I believe we should assert our rights and demand such legislation as will give us what we need. Allow me just a word as to the breed and handling of sheep as it applies to us in this section of Ohio. My experience has been almost exclusively with the South Down breed. For our part of the state I believe this breed is the best. It is a most excellent mutton sheep and shears fairly well and is the most hardy, with the exception possibly of the merino, and I find the ewes to be the best of mothers. Allow me in this connection to give you my experience with a bunch of twenty-two high grade South Down ewes bred in 1896. I pastured them in woods and blue grass pasture during the summer months, keeping

rock salt in a box in the field, and leaving them out day and night to let them graze at night and lie in shade in the heat of the day, this I consider essential to the best results. In the late fall I brought them to the barn, provided them an airy but dry stable to house them every night and all bad days.

I wish to emphasize the fact that sheep should not be allowed to get wet in the winter, as there is not enough heat in the animal to dry its fleece quickly, and bad results follow. I placed them on a grain ration of corn and barley ground together, half of each, and all the fodder they could eat. They did finely were in splendid condition at lambing time, with fine large well shaped udders. The lambs came strong; every ewe had twins but not a drop of milk. I lost ten lambs in two successive days, before I suspected the cause. I made an examination and found that the ewes' udders were caked hard. I took them off grain ration, turned them out on rye pasture an hour every day, fed the lambs with cows' milk from a bottle for a week and did not lose another lamb. I believe there is profit for every farmer in Montgomery county in a flock of sheep; the size of the flock to be determined by the size of the farm and amount of pasture the farm produces. I know of no stock that can be kept on the farm with as little feed and that produces such good results. I am told that sheep will eat two hundred and fifty varieties of weeds that other animals will not touch. I do not know this statement to be a fact. I hope I have not raised that number of kinds of weeds. I consider a good South Down ewe better than bank stock; you can take three coupons from her every year, one in May in the shape of the fleece and two in September in the shape of twin lambs.

SHEEP AND EARLY LAMBS.

By H. S. KELLEY, SAYBROOK.

[Read at the Farmers' Institute held at Geneva, Ashtabula County, December 14 and 15, 1896.]

There are four hundred and forty-four sheep in Geneva township, as returned by the assessor, and I have no doubt he found every one, so that the farmer could pay his share of taxes with which to pay the large salaries of those that are willing to serve the dear people. Now, four hundred and forty-four sheep divided among four or five thousand, the population of Geneva, doesn't look as if we were very much interested in the question of sheep, or early lambs, for we are taught by the very best authority that where our treasure is, there will our hearts be also. About one sheep to every ten of population doesn't look as if the business was being overdone. Why, the people of Geneva could eat every sheep in the township in a week and be hungry for more by Saturday night. Now, when nearly everything else is being overdone, it seems to me that here is an opportunity to engage in something that will pay, if the details are properly looked after.

If I did not have sheep, I should most certainly buy some. I should want the kind that would have lambs, and would try to get those that would have twins. A sheep with twins will earn about two dollars more than those that have one. I like sheep from two to four years old. A sheep, to be a good mother, needs to be of good form and of robust constitution, which is shown by a short neck, wide on the shoulders and with plenty of capacity for food.

I would not buy a sheep with a cough or one with catarrh, or a flock, if many in the number needed tagging.

If many are to be kept together, those that are termed close woolled, are the most desirable. It don't pay to keep a sheep that does not raise a lamb; all such in a

flock are kept at a loss, as it will cost two dollars per head a year, usually, to keep them, and with wool at present prices you cannot get pay for food consumed. Salt the sheep a little at a time, and often, for best results.

Don't leave them out in the cold rains of winter. Generally, I think it best to let them have the run of a small pasture every day, if they prefer, but be sure to have them in the yard before dark every night and keep them shut in until the morning feed is eaten.

The barns or sheds should be fourteen feet wide and one foot long for each sheep kept, with racks made in sections each fourteen feet long. The feed troughs should be of two boards, one foot wide and nailed together, with pieces fitted at the ends; these should be a little less than fourteen feet long. The racks should be two feet wide, with posts of two by four inches at the corners. The bottom board should be one foot wide, and set two inches from the floor with one foot space, and then the top board of ten or twelve inches. I am careful about the dimensions, as they are of consequence when the time for caring for lambs comes. These racks should be placed lengthwise of the stable, close together, so as to form one continuous rack. This leaves room when they are feeding for others to go by without crowding.

The troughs for grain should be outdoors. There should be a door at least six feet wide to the stable. Feed the sheep grain and then shut the door. Put hay in the racks and open the door. Do this at the same times, twice every day. Shelled corn, oats and bran make a good ration. One pint per head a day will keep them in good condition if they have good hay, or cut cornstalks once and hay once. They should have good water and plenty of it, without having to go far for it.

Carrots are an excellent feed and I have raised nine hundred bushels on one acre. But with bran at ten or twelve dollars a ton, I think it is a cheaper feed, if you have to hire much of the work done, and it answers every purpose.

I would buy a good ram that was as nearly perfect as could be found, and when the time for breeding came, would try to have some fresh feed to turn them in, as the lambs will come nearer together and be more vigorous, two things greatly to be desired.

Winter lambs do not pay here, as we have no market for them, and it costs too much to raise them for the ordinary prices they bring. Last year I had five sheep that had seven lambs. They got so that they would eat twenty quarts of grain a day. I sold them before grass came at three dollars apiece, that being all I could get.

I think the best time to have lambs come is in the middle of March, as then you will be through by the 10th of April, when one usually commences the spring work.

You need a good, warm stable. I prefer to have the sheep shed connected with the cow barn, and as fast as the lambs are dropped, put them into the cow barn for at least twenty-four hours. I have some panels made to put from rack to side of barn, making pens three by six feet, so that sheep can eat from the rack. These are easily put in place and easily taken away. They should be so made that lambs cannot get from one to the other. Every sheep that has twins should be placed in such a pen and kept there for at least twenty-four hours.

If a lamb gets chilled, take it to the house and put it into warm water, keeping the water at an even temperature for two minutes; give it a teaspoonful of whisky; rub dry with a cloth, keeping it near the stove, and give it some milk as soon as it will take it, then take it back to the sheep. All sheep having single lambs should be by themselves and the sheep with the young lambs may be put together as soon as the lambs have nursed once. You may make this flock as large as convenient, but the places containing sheep having twins, should be gradually enlarged and not more than ten or fifteen sheep should be put together until the lambs are two or three weeks old.

I would change every male lamb from four days to four weeks old. When the lambs are three or four days old, give the sheep more grain, about a quart a day, and be sure to make a place for the lambs to eat, separate from the sheep. Their feed should be of the same kind of grain, and should be kept where the lambs can get it at will. These troughs should be cleaned once a day.

When the lambs are being dropped you should see the sheep the last thing before going to bed and the first thing in the morning, and get up once in the night to look at them. If you find a sheep that you are sure will lamb before you see her again, put her in one of the pens, and generally no harm will result.

Try every sheep and see that she gives milk on both sides. If there is not milk enough, you should have a bottle with a rubber nipple and help out. Take your bottle to the cow and milk in it. Put on the nipple and feed the lamb at once. Don't let the milk get cold; don't put anything in it. A common lemon extract bottle of milk will keep a lamb five or six hours.

You would better keep the lambs and sheep under cover all the time for the first two or three weeks.

The fourteen-foot racks, placed crosswise of the stable, will make the different pens. The fourteen-foot troughs can be placed inside the racks for grain.

Clean the stable before the lambs begin to come. About the 10th of April let the sheep and lambs out for a short time, and gradually put more together. Have a field of rye close to the barn, where the sheep may be turned through the night, until good pasture comes, and let this place be so arranged that the sheep may get under cover during storms. Last year I bred fifty sheep and raised eighty lambs. Every sheep raised a lamb, and every lamb was a good one. The year previous to that I bred one hundred and thirty sheep and raised two hundred lambs. When you get two hundred lambs in one barn and preserve their identity, when one hundred and forty of them are twins, you probably will learn that all these minor things are of importance. I think March is the best time to have lambs come, because they are ready for the young grass when it comes. They need the most pasture when pasture is most abundant. You can sell them by July when flies, hot weather and drought come and when sheep spend their time in fence corners or shade. The sheep have time to recruit before winter, and you can cull the flock and sell the culls for fat sheep before winter by giving them a good chance.

Nearly all of this is done with grass, the cheapest of all feeds. Tag the sheep before turning on grass and shear as soon as settled weather comes. See the sheep as often as you can and make friends with them. It is a good thing to change pasture once in a while, if many are kept in one flock. Don't try to keep lambs that are coming one year old with older sheep during the winter. There are three things that are hard on the flock owners—dogs, thieves and adverse legislation.

HOGS.

By EDWARD ARMSTRONG, Richwood, O.

[Read at the Farmers' Institute held at Richwood, Union County, February 19 and 20, 1897.]

Farming without hogs is like running an engine without a safety valve, for it is a well known fact that a hog is one of the most profitable animals raised on the farm, and considering the low prices of horses, sheep and wool, and the vast numbers of cattle raised in the west—we cannot profitably raise cattle on our high priced lands, and compete with western cattlemen—we must look about us for something

we can raise with profit. Raising hogs, in large herds, has been tried by some of the western ranchmen, who have started with from fifty to one hundred brood sows, expecting to supply the *world* with pork, but in most cases these ventures have proven disastrous, as large numbers of hogs herded together, unless given the best of care and attention, will not thrive, and, if disease strikes a herd of this kind, heavy loss, and *often* financial ruin, stares the owner in the face; and, until there is an absolute cure discovered for hog cholera, swine plague, etc., the business of raising hogs will still be profitable to the Ohio farmer. Culture means to improve and, as my subject covers culture, I will try to give a few points on the breeding and care of hogs, and hope this question may be well discussed by intelligent farmers and hog breeders here to-day, that by so doing we may help each other.

I will not discuss this question from the stand point of a breeder of thoroughbred hogs, but will assume that the most of the farmers here raise *market* hogs; and it is of hogs raised for the market we will talk, although I breed nothing but thoroughbred Poland Chinas. I buy a good many hogs to feed for market and it is surprising the number of down right "ornery" scrubs one sees in picking up a bunch of feeding hogs, and I get them too sometimes; why, I have some in the feed yards now, that I got in November, that are a *little* better than when I got them, and you would not be surprised if you could see the sires and dams that produced them. I wonder why men will breed such trash, when well bred stock can be bought of reliable breeders at prices so low, that the breeding of thoroughbred hogs, to be sold for breeders, has almost ceased to be profitable.

Now, if you are to cultivate hogs, start right by getting the right kind of stock, of the breed you may prefer. I am not going to insist that the Poland China is the best hog on earth (although I believe he is), for if I did, these farmers would likely disagree with me; but what I mean is this: if you are going to raise hogs and expect to make a good profit on what you feed them, you *must* build on a good foundation. A good many farmers are cross breeding Chester Whites with Poland Chinas, Jersey Red or Berkshires, and I know I have handled some very excellent hogs of these breeds; but the trouble with a good many men is that they don't study the antecedents or the makeup of the sows they use, but think because a sow is white she is all right to mate with a Poland China or Berkshire, while the chances are she is all wrong. We know the market conditions have changed, and that cottolene, and like products have made a decreased demand for lard hogs, and the light, smooth hogs are selling for the most per pound, and the big three hundred and four hundred-pound hogs are not "in it." What we want to breed is a hog that can be reared at the least expense and sell for the most money. One man remarked to me last spring, "my old white sow has twelve pigs, and they are dandies." I think I have some of those same "dandies" in my feed yards now, and I expect to get them ready for market next spring after grass comes.

Now, brother farmers, why not get rid of your old, long bodied, slab sided sows, with legs as big as a yearling calf, and go to raising something the shippers want to buy? If you wish to cross the Chester White with the Poland China or Berkshire, go to some reliable breeder of Chesters and select a sow with a view of producing the ideal market hog. Select a sow of great depth, rather than length of body; in short, a *typical improved Chester*. See that she stands square on her toes, has a good eye and a quick ear, a good wide nostril and breathes freely, and has at least ten good teats; inquire how many pigs in litter, and if less than six, don't buy her; for my experience teaches me that a sow from a small litter usually produces small litters, and one from a large litter usually makes a satisfactory brood sow. I want to say here, don't let a few dollars stand in the way, if you find what you want. Don't expect a breeder who has spent years and been to great expense in building up a herd of hogs to a high standard of excellence—I say *don't expect* him to sell you a pig at *pork* prices, but be willing to pay him a fair price, and if the breeder

cares for his reputation, you will get the worth of your money. I will not weary you farther on this line but will proceed to the care and management of the sow and pigs we expect to produce.

I think the time to commence feeding pigs is about four months before they are farrowed, by feeding the sow liberally on such food as will satisfy her hunger and will not make her too fat and at the same time nourish the embryo pigs. A good feed is corn, oats and wheat bran. I feed a good many sugar beets and find they answer the same purpose. This will keep the sow in nice, healthy condition and enable her to bring forth a litter of fine, healthy pigs and will give her a good flow of milk, which will start them on their way toward Cleveland or Buffalo. Feed the sow lightly for a few days after farrowing, increasing the amount gradually until she is on full feed. When the little chaps begin to run around lively, fix a place where they can eat by themselves, and give them a little soaked wheat or corn, and they will soon learn to eat, and when two months old can safely be weaned; then they should have a slop made of ground corn, oats and middlings, with a little soaked corn once a day, gradually increasing the corn until they are ready for market. Of course, if you have a good clover pasture, they will do well without the slop, but, by feeding a variety, they will eat more and do better. Look out for pools of stagnant water in your pasture, for in them lies the enemy of the hog breeder, hog cholera. See that your hogs have plenty of pure water, and that they do not have too far to travel for it on hot days. I believe if the farmers would use proper care in selecting their breeding stock, and let their young sows be properly matured before mating, say at least nine months old, our hogs would have more vitality and vigor and be better able to stand an epidemic, and have a better chance of escaping. I believe, in nearly every case, an outbreak of the swine plague will be found to have started in some herd where the owner has utterly disregarded the sanitary condition of his hogs, allowing them to sleep around old straw piles without other shelter, and I think these filthy nests are the "hot beds" in which the germs of hog cholera are bred. These hogs become diseased and pass it on, and soon the dread disease sweeps a neighborhood. It is a good plan to keep a mixture of salt, lime and ashes, with a little copperas, in a convenient place for hogs; see the little pigs take plenty of exercise, keep them free from lice and worms, treat your hogs kindly, get acquainted with them, rub them occasionally so they won't be afraid of you, then, if necessary, you can go into a pen at farrowing time with no danger of leaving a part of your trousers for the old sow to make a nest of. Hogs that have been handled quietly and been treated kindly, are very little trouble to load when you want to take them to market. No need to worry two or three pounds off each one of them, and perhaps kill one or two before getting them in the wagon. This paper is now too long, but I do want to emphasize the *fact* that it is a shame and a disgrace the way some farmers treat their hogs, and yet, there is no farm animal that will respond more quickly to kind treatment, and, if we are going to breed the market hog, his life at best will be a short one, so let us make it as pleasant for him as we can.

THE PROFITABLE HOG.

By M. C. THOMAS.

[Read at the Farmers' Institute, held at Cable, Champaign County, December 2 and 3, 1896.]

Without an exception the United States stands in the foremost rank in the production of pork. Yet we hear the hog spoken of in unfavorable terms by some. A noted writer has said the hog was "the animal into which the devil went and from which he never returned."

Again we hear him spoken of in more favorable terms. In New England and the Middle States where the farms are small, he is "the squealer that pays the taxes." In the great corn belt of the prairies the hog is relied upon to pay the interest upon the mortgage and eventually to lift it, and even in Ireland, the hog is termed "the little grunter what pays the rint."

If a person will notice the stock of hogs some farmers keep and the manner in which they are kept, he will not wonder at the saying "it does not pay to keep hogs because they just eat their heads off."

There are two important points to consider in the raising of hogs for profit. The first is the selection of your breeding stock, and the second is the care and feeding.

SELECTION.

I do not intend to dictate to any one the breed of hogs to keep, but for my own use, I find no breed better than the Poland Chinas. They are very docile, are easily kept, and are ready for market any time after they are four months old, a feature that should not be overlooked by any one. In the selection of a hog avoid one with too heavy a bone, thick hide and a wooly, bristling coat. These characteristics denote slow growth and hard feeding qualities.

What we want is a hog that will grow rapidly and carry enough flesh to be marketable at any time, at the top price. To get a hog of the last named type, there are a few important points to take into consideration. See that it has a nice, smooth, glossy coat of hair, a good medium sized bone and stands nice and straight on its feet; avoid a hog that is narrow between the eyes, with stiff ears, light jowls, long nose and contracted chest. Now, some may say that it is not necessary to note all these points in the selection of a hog, but I will just say that if you expect to raise hogs that will take the eye of the buyer, you cannot be too careful about the points just mentioned.

THE CARE AND FEEDING.

The shelter for hogs need not be expensive, but every one who raises them should be provided with enough shelter to accommodate all his hogs, and have the building so arranged that they will have access to it at all times.

Now, to illustrate this; a farmer is feeding a bunch of hogs out in the open field during the late fall; whenever there is a storm, or it turns cold, the hogs are obliged to take it, which prevents them from fattening, and it also takes an extra amount of feed to even keep them where they were before the storm. On the other hand if they had been provided with shelter they would have done much better, with a great deal less feed. There should be several feed lots near the barn and hog house, so that hogs can be divided into bunches to suit their size, and they can be fed to suit their needs, also, as hogs of different sizes and ages require different kinds of food.

To be certain of good, strong, healthy pigs (which is very essential to success), the care of the brood sow is of vast importance. She should never be confined in close quarters when the weather is fit for her to be out and exercise; she should not be fed much corn, as corn is too heating; instead feed bran mash, parings, a little oil meal occasionally, and just enough corn to supply the necessary fat to keep her in good flesh. Some advocate that brood sows to do well must be thin in flesh; but give me a sow in good flesh, as she will invariably give her pigs a better start than one thin in flesh will.

THE CARE AND FEEDING OF THE PIG UP TO SELLING TIME.

As soon as the pigs are old enough to eat and drink there should be a place prepared for them so that they can be fed by themselves. I have heard men say that in this advanced age, it does not pay to slop pigs, but I say it does. If it can

be had, milk is as near a perfect ration to feed pigs as can be found. Shorts or middlings and corn meal in equal parts, with a little oil meal mixed and made into a slop, is also a good feed for growing pigs.

Not long since, in passing a certain farm, I could not help but note the way some men do things. The farmer was just feeding his hogs, on the south side of the barn; it had rained the night before, and where the water had fallen from the eaves the ground was very muddy; instead of carrying the corn to solid ground the man threw it in the mud, and as every ear would strike the ground it would bury itself in the filth, and the hogs had to hunt for it.

A man who will feed hogs in such a manner as that, need never expect to achieve very great success in hog raising.

The word *push* should be foremost in our minds in the raising of pork for profit. I was talking to a farmer the other day about selling hogs at from six to seven months old that would weigh from two hundred to two hundred and fifty pounds, each. He said: "I never sell at that age, I just feed them along until they are eleven or twelve months old and then fatten and sell them." I cannot see where there would be any money in this way of doing business; for my part I prefer to let the sows raise two litters a year and market them when they are six or seven months old.

REGULARITY IN FEEDING SHOULD ALSO BE A MOTTO.

When feeding our hogs the last month or two before marketing, we drop the slop and feed them all the corn, twice a day, that they will eat up clean, and all the water they will drink. Some advocate feeding oftener, but I think feeding oftener than twice a day is injurious, as it does not give the stomach any rest and they do not digest properly what they do eat.

I have seen farmers who would have a swill barrel, and empty it to their hogs whenever they got time, probably once or twice a week; the hogs would then gorge themselves and it would result in great injury. They would be much better off without the slop than to get it in such a manner. I know of nothing better to illustrate this than the tale about the Irishman that was feeding a pig for his meat; one day he would feed it all it wanted, then for a day or two he would not feed it anything. When asked why he did not feed it every day, he said: "Faith, and I want my mate to be a strake of lane and a strake of fat."

I will just say in conclusion that if we will attend to every minute detail in the feeding of our hogs, and properly care for them, we need not worry about the lean and fat; also, if we will raise hogs in a business way and stick to it, through thick and thin, it will be a pleasure, and the greatest of all there will be as big a profit in it as any business the farmer can follow.

POULTRY.

By C. W. MILLER.

[Read at the Farmer's Institute held at Xenia, Greene County, January 15 and 16, 1897.]

The word poultry means domestic birds or barnyard fowls. These include chickens, turkeys, ducks, geese, etc., and any one of these four kinds of fowls is very profitable. This fact is proven by the extensive turkey and geese ranches, and chicken and duck farms now established in the United States. Anything that a man

can afford to follow exclusively, will be profitable if adapted to the surroundings and the people.

That branch of poultry in which we are most interested to-day, and which we can most readily turn into cash at a good profit, is fowls proper, or chickens. Of these there are three general classes, viz., the very large or Asiatic class, the chief of which are Brahmas, Cochins and Langshans; the medium size or American class, including Plymouth Rocks, Wyandottes, Sherwoods and others; and the small, or Mediterranean class, as Leghorns, Minorcas, Spanish, Hamburgs, Andalusians, etc. The proper breed for the farmer is the one he likes best and thinks the most profitable.

Choose one breed and stick to it, as nearly as possible; let them be thorough bred fowls; thorough breds are better than cross breds, and cross breds are better than mongrels. You will get better results by studying and working with one breed ten years than by trying half a dozen breeds in that time.

The Plymouth Rocks or Wyandottes are among the most profitable general purpose fowls. Some breeds are great layers and seldom sit; others seldom lay and want to sit most of the time; the Plymouth Rocks and Wyandottes will do both and do them successfully. They are hardy as little chickens, a strong point in their favor. If they are lazy it is the owner's fault, they are naturally active and industrious; they grow quickly to marketable size, and bring the top price as spring chickens. If they are hatched in April and kept growing by good attention through the summer, the pullets will begin laying by November first, unless they get too fat or are troubled by lice. With proper attention and a warm house, they will lay well all winter when fresh eggs are scarce. In the spring, when eggs go down to eight or ten cents per dozen the business Plymouth Rock and Wyandotte stop laying and begin sitting, thereby turning ten-cent eggs into three-dollar chickens, at fifteen weeks old, if well cared for. What better combination could you wish?

Now as to rearing little chicks; *feed nothing for twenty-four hours after hatching*; then feed bread crumbs, either dry or soaked in milk and squeezed dry, oatmeal or rolled oats. These are the safest feeds for the first week. After that time feed cracked and whole wheat as soon as they will eat it. Dust them and the mother for lice once a week. Don't let the chicks out of the coops till the dew is off the grass and they will never have gapes.

If you keep fowls for eggs, market the cockerels as soon as possible after three months of age and give the roosting room to the pullets. Feed these pullets a variety. In the morning give mash of equal parts bran, middlings and cornmeal. At night give whole wheat, oats and scorched corn mixed. In cold weather give cooked vegetables at noon. If allowed to run after hogs and cattle that are being fattened, they will become too fat to lay, and will make good, profitable market fowls with little expense, as in running after the stock they utilize what would otherwise go to waste.

Next, as to houses and housing poultry: the house should contain from one to two hundred square feet of floor space. No farmer's poultry house should be smaller than ten feet square, and never more than twenty fowls put into a house of this size. If you want to keep more fowls through the winter, build larger houses or more of them. The shape of the house is not of so much importance. The absolute essentials for success are warmth, a well graveled floor, movable perches for fowls to roost upon, dropping board or platform underneath the perches and one glass window and, if the house is very large, two windows. If eggs are wanted *in winter*, the house must be made warm, the cracks must be stopped and all chance for draft shut off. Hens cannot lay eggs when all their energy is required to keep comfortable.

The floors should be graveled to the tops of the sills to keep out minks, weasels and rats, and to prevent dampness. A good sized box should be filled with road dust,

sand or coal ashes. Hens must dust themselves to keep down body lice. The perches must be movable so they can be taken out and cleaned and soaked with kerosene. If there is not a dropping board or roost platform under the perches, the house cannot be kept clean, and filth and lice are the results.

When the days of deep snows and hard winter appear, the hens must be kept shut up, and fed and watered just the same as your cattle and horses. The hens cannot dust themselves, scratch and exercise as they should unless they have light, and at least one glass window is a necessity. If the fowls are confined long grit should be supplied; coal cinders, crushed oyster shells or some of the prepared commercial grits will be found better than doing without. Lime, also, has to be supplied in some form; oyster shells, air slaked lime and green cut bone all answer this purpose. Green cut bone and meat scraps fed twice a week, I have found to be the best of egg foods. It is only when confined in cold weather that these extras are absolute necessities, though they will all pay several times their cost in extra egg production.

I now come to the most important item of the poultry industry. Everybody's chickens have lice. Nearly everybody's chickens *suffer* from them. They are natural to fowls. You can hatch chicks in an incubator and rear them in a clean brooder keep them separated from all other fowls, and if their quarters are permitted to get filthy after they reach the age of three or four months, and no effort is made to keep them down, you will find lice. I have tried that experiment and I know my statement to be a fact. Fowls are doctored year after year for liver disorder and cholera when there is no trouble except lice. Lice are of three kinds; those which infest the head and neck, body lice that are found under the wings and all through the fluff, and spider lice or red mites that infest the buildings. Those of the head are most destructive. They will kill chickens, young or old, if unmolested. Red mites that infest the houses and roosts are next. They stay on the walls and perches through the daytime, and crawl upon the fowls and suck their blood at night and crawl off again in the morning. They frequently get so annoying in the spring and summer that the poultry absolutely refuse to roost in the buildings, preferring the trees instead. If hens have good dust baths they will rid themselves of body lice, and they are the least to be dreaded. Now as to remedies; any reliable insect powder will prevent head and body lice if used regularly and often. Whitewash, containing a little carbolic acid, used twice a year, inside and outside of the buildings, and plenty of air slaked lime or land plaster kept sprinkled over dropping board and upon the ground will keep the house sweet smelling, the air pure and the lice at a distance. Kerosene oil will kill lice of every description. If poured upon the perches and platforms once a week in summer, and once a month in winter, it will be found an adequate remedy for spider lice. If a cloth saturated with it is rubbed over the fowls' heads and necks, and under the wings and legs and upon the fluff, it will kill lice and nits of every description. The fowls, however, must be kept in the shade for twelve to twenty-four hours afterward, as sunshine has a bad effect upon greased poultry.

A few words upon the use of brooders. Get good brooders or your poultry venture by artificial means will be a failure. You will, unless in love with the business and very careful, fail with good brooders and you can never succeed with poor ones. All good brooders are large and well built. Small ones would do if they were not so often overcrowded. An overcrowded brooder is generally a failure. Successful brooding is harder to accomplish than successful hatching. This is the experience of the largest breeders in the country. Mr. James Rankin, one of the foremost breeders in the United States, and a manufacturer of good incubators and brooders, says that hatching, with him, is easy. The greatest loss he bears is in brooding.

I have practiced artificial brooding two years, and I know it can be done with moderate success; but, my friends, don't undertake it unless you like the business well enough to study it carefully. In attempting artificial poultry culture, my advice is to buy a brooder the first season and use it to raise the chickens hatched by half a dozen hens. You can immediately reset the hens. It doesn't hurt them to sit six weeks. Thus you can get the necessary experience in brooding without much outlay of money. If you are not successful in your first attempt, try again the next season; but don't buy an incubator unless you can take care of the chicks after they are hatched. It's not the number hatched that fills the purse, but the number of large, fat chickens that you sell. Above all, don't try the plan I have heard mentioned, of hatching chicks in an incubator and giving them to hens to raise. It can be done, but you can't realize the interest of the money invested in the incubator by that plan.

In conclusion, I want to say that if I were to tell all the evils of poultry raising in two words, those words would be "*overcrowding*" and "*inbreeding*." These twin evils produce all the other misfortunes of poultrydom. The first produces feather pulling and lice, while the second gives run down, small sized stock that are the prey of all the diseases of chicken life.

Now, I have tried to speak simply and briefly of the more practical points that interest people in everyday farm life. Everything I recommend I have tried. I tell you nothing that I don't know from experience. To those who are more deeply interested in poultry, and who desire to use artificial methods, a deeper study is required. To them I would say get a good poultry journal and other special literature. Study them with judgment and give close attention to the details of the work, and you will get the reward which patience and industry always bring.

SOME NOTES ON POULTRY RAISING.

By MRS. L. B. GLAZIER, Amesville, O.

[Read at the Farmers' Institute held at Amesville, Athens county, January 13 and 14, 1897.]

It has been truly said that woman's work is keeping things clean. Clothing and character, crockery and citizenship, atmosphere and art are in constant need of purification.

It seems to me that nowhere, more than in the average farm home, is there room for the exercise of all the ability, both physical and mental, of the strongest, the most able woman in the world.

Consider for a moment, if you please, a few of the employments, callings and trades that are combined in the daily routine of many a farmers' wife; cook, housemaid, laundress, dairymaid, seamstress, nurse, mother, guide, philosopher and friend; and much of this over and over again, always doing and always to be done, to say nothing of the hospitality that she is expected to exercise in the home. In these modern times the farmer's wife is not much behind her city sisters in charitable and philanthropic work.

After all this array of duties which women feel more or less obliged to perform, I want to urge still other employments for women on the farm. Any occupation that will take one out of the house into the open air and sunshine, that affords a change of thought and feeling, and yet is not too severely muscular, and that promises a fair chance of bringing profit, as well as health and pleasure, should be welcomed. Among such I would recommend poultry raising.

To some farmers, chickens seem very insignificant, intended only for women's and children's amusement, hence their willingness to relinquish the care of them—but when you try to make them believe that a hen will not eat her head off every year, "that's another story." Were it not for the good eggs and meat, custards and puddings, furnished the table by the much maligned biddy, her cackling would not be tolerated by them.

The poultry business assumes greater importance in the eyes of all, when they consider the figures in the case.

The value of the poultry product in the United States in 1889 was one hundred and ninety million dollars, while there was imported into this country two million four hundred and eighteen thousand nine hundred and seventy-five dollars' worth of eggs. The amount of the combined egg and poultry trade in Chicago alone in 1892 was fourteen million dollars without including that brought to houses by farmers or raised in the city and suburbs; and for any year since, the figures have surely not been reduced, though I am unable to give any later statistics.

Many farmers who know that poultry pays now, are afraid to keep more than a dozen fowls, for fear the business will become overdone and prices fall below the cost of production.

They need not worry about that; croakers have talked that way ever since Mrs. Noah insisted upon taking her favorite hen into the ark, when no doubt Mr. Noah or one of the boys told her that after the shower there would be no market for eggs, besides he did not believe the old hen was worth saving anyhow; but from that day to this fresh eggs and good poultry have never gone begging for purchasers.

Surely in these days when grain and wool sell for so little and good horses and sheep for one-third or one-half of what they brought ten years ago, it seems a matter of necessity that almost every farmer and farmer's wife should look to the smaller and in fact every legitimate means of paying expenses on the farm, and, if we have debts resting upon our shoulders, the greater the need of enterprise in all directions.

Why cannot every farmer's wife or daughter, as the case may be, get out into the fresh air once in a while, away from the worries of the house, and by raising and caring for a nice flock of chickens each year, provide (with perhaps some help from the men who can well afford to aid a little, and to furnish plenty of suitable food), a little purse of which no one need be ashamed and from which, if necessary, help in the house for a few months out of the year can be paid; groceries for a good sized family supplied and the woman of the house, in addition to the enjoyment of better health, feel that she is doing her share of the burden bearing? Many women throughout the United States are annually deriving enough money from the fowls to clothe the entire family from year to year.

Experience is the greatest teacher in the poultry business as well as in all other callings, and our own mistakes serve as mile posts to keep us on the right road to success.

It is neither necessary nor expected in the average home that the women should do the rough work connected with the poultry business. Let the men build the houses, the plans for which are legion and are found in almost every issue of the agricultural press. I can't speak from experience of the ideal poultry house, but when I build it, all the nests and roosts will be movable as well as the feed and dust boxes, so that when the men clean the hen house these may be removed for cleansing with kerosene, should the house be infected with lice.

It is absolutely necessary that fowls, to do well, should have plenty of fresh, clean water, and the greater the variety of food given them, the more eggs we may expect to gather. These are things that women can provide them and when they go to the bin for potatoes for dinner, why not get a kettle full of the smaller ones and cook for the chickens, on cold wintry days? To provide warm food for the poultry

in winter is not an easy task, but we know from experience that it pays to give the fowls a warm breakfast which they relish as much better than a cold one as we do, and for which kindness shown them they will repay us with well filled egg baskets instead of the small number of eggs which we might otherwise expect in cold weather. It pays as well to warm their drink and it is necessary too that fowls should have drink more than once a day. If we will notice in the summer time we will be surprised at the amount of grass that chickens will eat. Clover hay is said to be a good substitute for grass in winter, but of this we cannot speak from experience. All know how they relish cabbage leaves, parings, beets or other vegetable food given them in winter, and if we give them cracklings or bits of meat they will repay us by songs of gladness.

Filth in some form or other is one of the chief causes of sickness and death among poultry. The germs of some poultry diseases are probably generated by filth and all cases of sickness among fowls and chicks are certainly aggravated by filthy surroundings. Dampness in poultry houses is the direct cause of many diseases. It does not hurt chickens to run about in the rain and get their feet wet forty times a day; but it does hurt them to roost or be closely confined in a damp house and we who raise young chicks all know that continual dampness in the coops kills off more of the little fellows than any other cause.

Lice are frequently the sole cause of the untimely "taking off" of whole broods of downy little chicks, and while they may not actually cause diseases among older fowls, it is quite certain that fowls whose strength has been lowered by lice are more liable to die when poultry disease comes along, for it must be particularly remembered that lice on fowls are as detrimental to them as weeds are to farm crops.

We have had no trouble in getting rid of this pest by the use of kerosene on roosting poles and in the nests and coops. It is well to use this once a month at least during the summer season. Some dip their fowls in kerosene emulsion on bright warm days allowing them to dry in the sun but we have never had occasion to resort to any such heroic measure for lice.

It is an old saying "An ounce of prevention is worth a pound of cure," and it applies in the treatment of poultry as well as anything else, for it is much easier to prevent disease than to cure it among fowls and a great deal cheaper as well. The worst disease with which we, in our few years' experience, have had to contend, is the so called chicken cholera and we have observed that when we keep the surroundings of our chicken houses and coops clean, supply the fowls with plenty of fresh, clean water, give them an abundance of grit, such as oyster shell, limestone and ground bone and occasionally give as a tonic Douglas mixture in the drinking water and frequently a bran mash in which we use a goodly amount of Venetian red, we have little or no sign of disease in our flocks—but, on the other hand, twice have we grown careless, failed to properly clean our poultry houses and perhaps overfed the fowls with corn alone, and as a result had disease to contend with. Our experience teaches us to say with Fanny Field of poultry fame, that when sure we have cholera among our fowls "the cheapest and best way is to kill the sick fowls at once, and burn their remains or bury them deep in the ground. Then no matter how much you may have already done in the way of cleaning up, when you fancied your fowls were not looking so well as usual, have another thorough cleaning of all houses, yards and places where the chickens are in the habit of congregating.

"Disinfect by whitewashing, burning sulphur in the houses and coops (closely shut) and with copperas and carbolic acid solution. In nine cases out of ten this cleaning and disinfecting, together with the use of Douglas mixture in all drinking water for a day or two, to counteract the effects of the cholera germs that may be in the systems of your apparently well fowls; (the said cleaning being thoroughly done) the disease will be entirely eradicated and in the tenth case with more clean-

ing and disinfecting the work will be completed." A prominent poultry writer says, "while genuine cholera is scarce, many persons imagine that when the fowls begin to mope around and gradually weaken and die, that cholera has attacked their flocks. In many of these cases the sickness is caused by indigestion, lice and filthy surroundings. Irregular feeding gradually brings on indigestion in fowls, just as in man, while absence of sharp grit for grinding material is also very detrimental to their health, the natural consequence of which is a sickness somewhat similar to cholera. Cholera rarely attacks a flock in winter, while from July to October hundreds die. Remember that when your fowls begin to refuse to eat and in a week or two die, that it is not cholera that kills them; for cholera kills in twenty-four to forty-eight hours, never longer." It is very discouraging, to say the least, to be necessitated to kill fowls or to adopt such heroic measures as I have mentioned, but in a few months we forget these troubles, gather our eggs as usual and resolve thereafter to use preventives in time to avoid an epidemic.

There are several other diseases with which poultry raisers have to contend, but with such we have had little or no experience. While few farms have suitable houses for the poultry in extremely cold weather, and I am not here to advocate the building of such in these times, when expenses are so closely to be considered, still we do know that it is from that part of our flock that roost in the dry and reasonably comfortable houses (which houses all may have) that we gather the most eggs in the winter season and not from the neglected fowls that roost in trees or on the fences in all sorts of weather.

As to varieties we have had little experience with any other than the Brown Plymouth Rocks and Brown Leghorns, of which kinds we have about an equal number. The Plymouth Rocks are general favorites the world over. They are adapted to either farmer or fancier; their disposition is gentle; they bear close confinement well. As egg producers, sitters and mothers they are very satisfactory. The young are hardy, quick growers, easily reared, and if one wishes to raise for market, are ready to dispose of, as spring broilers, in from eight to ten weeks from hatching. The White Plymouth Rocks are said to be identical with these except in color. They possibly make better market fowls on account of the absence of dark pin-feathers. Plymouth Rock fowls when fully matured weigh from seven and one-half to nine and one-half pounds. Of the Leghorns, a point that makes them desirable is their great activity and peculiar knack of taking care of themselves. They mature early, pullets sometimes laying when four or five months old. They are said to be non sitters but our experience has taught us that when a hen of that variety takes it into her head to sit, she will sit, and it is next to an impossibility to break her of the habit. Though one of the smaller breeds, Leghorns are at the same time fine table fowls; having small bones with plump meat which is delicious and tender. There is no standard weight for Leghorns. While we believe that the Leghorns are better layers than the Plymouth Rocks, we cannot agree with the many who claim that it takes less to feed them because they are smaller fowls, for we have observed that in our flock when feeding the Leghorn appears to pick up two grains of corn or wheat while a Plymouth Rock picks up one, and yet when we kill the fowls for table use the Plymouth Rock hens are almost invariably fat while the Leghorns are not.

We have never made a practice of raising chickens for early market, but think it could be done with profit without incubators or brooders, though, no doubt these are very useful if properly managed. We aim to have the greater number of our chicks hatch in April, in order that we may gather eggs from the pullets in early fall, and by the first of July we begin to use the young fowls on the table. I think we would not be over estimating in saying that we used at least seventy-five young chickens on the table during the summer months last year. These were nice to have and saved the necessity of buying beef for the table. From experi-

ence I can say that it does not pay to keep any hens to die of old age. Hens more than two years old are seldom profitable for eggs.

Producers should see that they do not sell any other than good and fresh eggs and it would only be a matter of justice that merchants and produce dealers should regulate the prices according to the condition in which the product is received.

If I now address any women who are engaged in the occupation of which I speak, I would say to such, enlarge your business as your experience increases and some day when a good part of the proceeds of the market load are handed to you as received from the eggs and chickens, don't be surprised to hear your husband, who may have hitherto been somewhat skeptical in regard to the matter, say, "I think we would better go into partnership in this chicken business." During the past year we had quite an epidemic of what we then supposed to be cholera, but which we have since concluded may not have been, and by which we lost at least fifty fowls. While we do not consider our record anything of which to boast, it might interest some to know the number of eggs sold from our flock. In 1895 from a flock of perhaps one hundred and twenty-five hens we sold nine hundred and thirty-five dozen which brought ninety-nine dollars and thirty-one cents, the lowest price per dozen received during the year being eight cents and the highest twenty-cents. This amount together with nine dollars and sixteen cents received for some old hens sold, made the amount of income from the poultry one hundred and eight dollars and forty-seven cents for that year and for 1896 from a flock numbering one hundred and fifty perhaps, we sold one thousand, two hundred and forty-nine dozen which amounted to one hundred, twenty-four dollars and eighteen cents. We kept no account of eggs used for hatching or on the table and for cooking purposes. This number would amount to many dozen dozens in the course of a year, however.

We believe that those who engage in the poultry business, to succeed must be progressive, industrious and energetic, quick to accept new ideas and, if worthy, to put them into practice and keep everlastingly at it, giving it the same attention that it requires to conduct any other business successfully. There are people who would fail at any work but if we conduct the poultry business with the same care as a successful farmer or merchant does his we will make more money on the capital invested than either of the others.

TURKEYS.

By MRS. FRANK MAIZE, Wooster, O.

[Read at the Farmers' Institute held at Wooster, Wayne County, November 30, and December 1, 1896.]

So much is said and written about poultry, that it is almost presumptuous to attempt to tell anything new, and yet it is seldom that the turkey receives its share of attention from the pens of poultry writers. In fact, when we speak of poultry we always think of chickens, exclusively, as they generally constitute the farmer's stock. However, we think if the turkey were better known, and its habits better understood, it would be more frequently found on our farms.

The turkey is a native of North America, having been found in large flocks in this country in its wild state, and only passing out of existence as it is crowded out by the advances of civilization. I am sorry to be compelled to tell you this, for it completely destroys all the historic and legendary facts concerning the proverbial "Job's turkey."

Many of our older settlers recall the days when, if a turkey roast was wanted, the man of the house shouldered his gun and took a pleasure stroll through the adjacent forest, returning ere long with the object of his search, and also an appetite equal to doing justice to the bird after the good wife had prepared it for the table. Now, however, the man has no share in the preparations for turkey roasts, he does not need even to shoot the fowl, and so long has he been out of practice, I doubt if he could shoot one.

Owing to their wild origin, they are a very shy bird, and the hens, in spring time, will wander off to make their nests. In order to prevent this, I have found it a very good plan to place empty barrels covered with brush or litter in quiet, secluded corners about the premises, and the hens will select these for nests, leaving you the eggs within easy reach. Some people set a turkey and several hens on turkey eggs at the same time, giving the whole of the little ones to the turkey to raise. While this is good, it is also as well to let a hen raise her own hatch, as they will become tamer and be less liable to wander far away. A turkey hen will lay three settings of eggs if you take the first two from her, and by giving these to hens to hatch, a large number of young turkeys will be obtained.

The first three or four weeks of a turkey's life are the most critical; if they can be safely kept until four weeks old, they are, thereafter, more easily raised than chickens. Their greatest enemies are vermin and dampness. I find it necessary to go over the entire flock once in two weeks, or oftener, greasing each bird with a mixture of lard and kerosene, to destroy the lice. They must be kept off the wet grass and not allowed to wander away until fully feathered. All they ask is a chance to grow, and no fowls we raise will make such good use of the food given them.

For the first few days I feed hard boiled eggs, chopped fine, also chopped onion or lettuce with gravel or grit, and plenty of fresh water; later, curd, as much as they will eat, also baked corn bread, made of buttermilk and cornmeal with a little soda; as they grow older, various grains, screenings, cracked corn, etc. They prefer curd to anything I ever fed them, and if it is drained perfectly dry, I have never seen any injurious effects follow its use. Occasionally, on damp or chilly mornings, a little Cayenne pepper mixed in the curd acts as a stimulant, and is beneficial.

I never found dosing or doctoring of any avail; when a young turkey wants to die you might as well save your time and patience and let it go, for go it will in spite of all you can do. However, the desire to "shuffle off this mortal coil" is not so great in little turkeys as many suppose, and if you can keep them dry and free from vermin, you will raise a large percentage of those hatched. After they are large enough to run about all day with the hens, they should have the freedom of the farm, and no one who can not allow them unlimited range should try to keep them.

They feast on grasshoppers and many other destructive insects, and after the wheat is garnered, they will live in the wheat fields, needing no more care until the corn is being husked, then they should be fattened, feeding them regularly as much corn as they can eat. Many turkey raisers prepare their birds for the Thanksgiving market, but we have found the Christmas and New Year's markets a little better, if one can keep the turkeys conveniently so long.

For a number of years past we have dressed and shipped our own turkeys, for if shippers can buy and dress turkeys at a profit, why should not we? The nearer you come to the consumer the greater your own gain. Of course this is some work and trouble, but if you want all there is in them it is work from first to last. We scald, pick, draw, and pack them in barrels with clean straw and ship them to market in the nicest shape possible, consequently getting top prices, and believe it pays to raise turkeys. Aside from the money there is in the business, a flock of handsome bronze turkeys is an ornament to any farm. There are no statelier birds, and with

their bright, glistening plumage, showing all the colors of the rainbow, their dignified bearing and their glowing heads, they make a picture, of which any one may well feel proud.

ALIEN OWNERSHIP OF AMERICAN SOIL.

By CHARLES H. TAYLOR, Cleveland, O.

[Read at the Farmers' Institute held at Euclid, Cuyahoga county, December 18, and 19, 1896.]

The question of our public land is one that has been before the people during our whole national history. To whom shall our public tracts go and what shall be the consideration therefor are questions of momentous importance. Of course, in starting out with a small population, anxious to secure to ourselves the best settlers for our vast tracts of land, we offered every inducement for an early cultivation of our soil. That this should be natural is evident to every one. When we consider that scarcely three million people dwelt upon the narrow eastern border of our country, behind them existing tracts of land practically illimitable in extent, we are not surprised that they were anxious for neighbors. At that time any one who desired to locate could have land for the asking. That was well. Having completed a very long, expensive, disastrous though successful war, the United States Government gave special terms to the brave defenders of the Union; that, together with the increase of our own population and the number of those who constantly thronged from foreign shores to settle upon these tracts of land, began to exhaust somewhat the supply. The condition later of the New England Farmer trying to bring from the earth the crops repressed and concealed by the bowlders and rocks of those granite hills, caused the younger element of that section to push westward. No doubt the poet was thinking of this condition when he said "Westward the Star of Empire takes its way."

Three conditions have combined to bring about a rapid settlement of our western lands; the vast tracts of territory which have been given to railroads to induce their construction; the descendant of the New England farmer pushing his way to a more fertile and pleasant environment, and settlers from foreign shores. It is not our purpose to-night to speak at any length concerning the first two causes but confine ourselves to the last one. We might say, in passing, that the condition of the farmer to-day is largely due to the almost limitless extent of the western farms and their immense fertility, which causes competition with the eastern farmer and oppresses him more than any financial or economic condition. We will not say whether the custom of giving such quantities of land to the railroad companies is right or not; we will say, however, that we think there is no excuse for proceeding further on that line. From the first there were some who seemed to have a very large insight into the future; they saw that there existed in these broad acres of our land an opportunity for speculation, and that, unless we were guarded in our actions, we would rapidly dispose of our vast tracts of territory and leave to our own people small opportunity for expansion. The question whether one who is still an alien should possess land is a very grave one. The United States has always been, and I hope may always be, ready, willing, and even anxious, to add to its number of citizens those from foreign shores who come here for the purpose of citizenship. In upholding our flag, and in maintaining our liberty, there has been a strong element for good in those sturdy and upright citizens whom we have drawn from subjection to foreign crowns. Having been restricted in their movements of liberty, and having felt the galling weight of the yoke that they were compelled to wear while subjects of kings, they were in a good position to ap-

preciate what it meant to be free and equal in the eyes of the law; therefore, their love of liberty was keen and they fought nobly for the maintenance of our flag. While we appreciate the value of this foreign element in our national life we must not forget that along with the desirable acquisition, there comes a large number of those who are not worthy to share in the inheritance of our fathers. The welcome of our government to the citizen settler to this western land has always been open and hearty; the stranger coming to our shores, if for the purpose of joining with us in the holy bonds of citizenship, has been likewise welcomed; the desire to populate our sparsely settled regions with an industrious and thrifty people is most laudable; we need men who are willing to go into this district and make the comparative desert and wilderness to bud and blossom like the rose. Our best citizens have been from among this class of people, and, if our country is to go from glory to glory, this class must not be allowed to die out. Labor is necessary, and it is just as true in the physical and intellectual, as it is in the moral world, that you must work out your own salvation. May the spirits of our fathers not desert their children, even if the conditions have changed, but may there be the same rugged character and moral back bone in them as was manifested in their fathers in our earlier national life. All honor to the sturdy pioneers of this, or any other community, who, by their lives and labors, have bestowed upon us this magnificent heritage. Our bosoms should swell with righteous pride as we remember the power and influence of our pioneer fathers. As we look over that grand galaxy of men who have won prominence in our public life, we can but feel proud that they were drawn largely from this class of people. It would be useless, indeed out of place, for me to say anything about the many, from Washington even down to this very day, who have gone from rural into public life and who have shed glory around the places of their birth; nor need I call your attention to the distinguished men who have been born and reared within a very few miles of the place where I am speaking. The firmness and energy developed under such conditions most admirably fit one for the arduous and exacting duties of after life. So, I say, we are anxious that these settlers have a place on our public lands. We welcome any one who is anxious to redeem these districts, but there does not exist one foot of land where there will be welcomed a settler who is to pay tribute to any landlord dwelling in luxury in a foreign clime. We may allow the foreign speculator to buy our bonds and have an interest in our manufacturing plants, but when it comes to the question of land we must insist on drawing the line.

The land of America is the heritage which we do not propose to give away or sell for a mess of pottage. This shall be the land of the free and the home of the brave, and not the land and home of the foreigner for which our citizens must pay. Bad as is the prospect which some see in the near future, when insatiate wealth will own the land for the farmer to till, what shall we say if the landlord be some alien owner? While we welcome any man who honestly means to become a citizen of our republic and assimilate with its customs and become one of its people, producing his share of national wealth, bearing his burden of taxes, supporting our free public schools and joining us in our American life, what welcome will there be for him who comes with the terms of his tenancy already made to some titled nobleman, and with no idea of severing his connection from his native government? If the question of landlord and tenant be one of the gravest importance, if it be a matter in which the national peace be menaced when we have both parties within our jurisdiction, what should be said when the landlord is a foreign aristocrat and his tenant a foreign subject? American soil must be for American citizens and not for alien subjects.

This land, further, should only be for actual settlers. We do not want to have any system of landlordism in this country, and to prevent it, our public lands should be granted only to actual settlers and then only in such quantities as they can take care

of themselves. So I say, when the foreigner comes into negotiation for the land of America, Uncle Sam should post the notice "Keep off the grass." Of course, there is a grand opportunity for investment in controlling these lands, and waiting for others to improve the property in various ways and then reap the harvest of increased valuation of land, but this should be prohibited. The land should be owned by the worker thereof. Land should be for every man, and no man should be compelled to pay tribute to a landlord, be he a nominal American or an alien Shylock. It has been the boast of our American citizenship that it was free; it has been our pride to behold the farmer dwelling on his own farm, producing wealth and profit from his own labor, for his own family and not contributing his earnings to the insatiate greediness of some landlord. We have defeated the foreigner by our arms. May the time never come when, giving him our land, we will awake to a greater slavery than the former condition would have been. That this question has attracted some attention, is evidenced by the fact that in the Second United States Supreme Court Report, one judge, in delivering his dissenting opinion, held that an alien had no right to hold land in this country. Had weight been given to his opinion, the condition that we are now in would not have been upon us. A committee was appointed by the House of Representatives which reported in the Second Volume of the First Session of the 49th Congress:

"There was an English syndicate which owned three million acres of land in Texas; a Holland syndicate which owned four million, five hundred thousand acres in New Mexico; another English syndicate which owned one million, eight hundred thousand acres in Mississippi; a German syndicate which owned one million acres; Sir Edward Reid and others, who owned two million acres in Florida; the Marquis of Tweeddale, who owned one million, seven hundred and fifty thousand acres; and Phillips Marshall and Co., of London, who owned one million, three hundred thousand acres."

These are but examples of the larger holdings, by aliens, of our lands; there are additional holdings which make the amount figure up to nearly thirty million acres, situated mostly in the western states, but some in Illinois and West Virginia. When this condition became evident to Congress, it passed an act:

"Section I. To restrict the ownership of real estate, in the territories, to American citizens, declaring that it shall be unlawful for any person or persons not citizens of the United States, or who have not lawfully declared their intention to become such citizens, or for any corporation not created by or under the laws of some state or territory of the United States, to hereafter hold, acquire or own real estate or any interest therein, in any of the territories of the United States or in the District of Columbia, except such as may be acquired by inheritance, or in good faith in the ordinary course of justice in the collection of debts heretofore created; provided this act does not conflict with the existing treaties.

Section II. That no corporation or association, more than twenty per cent. of whose stock is or may be owned by any person or persons not citizens of the United States, shall hereafter acquire or hold or own any real estate hereafter acquired in any of the territories of the United States or of the District of Columbia.

Section III That no corporation other than those organized for the construction or operation of railways, and so forth, shall own more than five thousand acres of land.

Section IV. That all property acquired in violation of the provisions of this act shall be forfeited to the United States."

So that if it is not possible for us to get back the valuable property which is now owned by foreigners, it is true that we are going to protect ourselves as far as the future is concerned.

The various western states have passed local statutes in regard to this matter. The state of Iowa, in 1888, passed an act which forbade nonresident aliens or cor-

porations, which were not organized under our own laws, unless more than one half its stock was owned by citizens of this country, from acquiring title to, or taking or holding any lands or real estate in this state by descent, devise, purchase or otherwise, only as hereinafter provided. When an alien acquires real estate by descent or devise he is allowed to hold such land for a period of ten years and no longer and, if at the end of such time, he has not disposed of lands acquired to a *bona fide* purchaser for value, or he himself has not become a resident of the state, such lands shall revert and escheat to the state of Iowa. This state allows a non resident alien to acquire and hold real property to the extent of three hundred and twenty acres, or city property to the value of ten thousand dollars, if at the end of five years such property comes into the actual possession of a relative of such purchaser, the occupant (being related to such owner within the third degree of kindred, or the husband or wife of such relative, and, further provided that such occupant becomes a naturalized citizen within ten years from the purchase of said property as aforesaid.

Any non resident alien who owns land in this state at the time this act becomes effective, can dispose of the same during his life to a *bona fide* purchaser for value, with the same rights as to securities as a citizen of the United States. Should such an alien hold a mortgage upon, or levy execution upon, real estate, he may acquire title to the real estate but must dispose of it before the period of ten years has elapsed. Upon resident aliens this act confers the same rights of holding property as upon citizens.

The state of Idaho passed an act recently of very much the same terms as the Iowa statutes, with the exception that they allow an alien only five years to dispose of this property after acquiring his lien. Illinois allows three years for the disposal by an alien of his real estate.

Thus we see that an effort has been made to stop the prodigal methods that formerly obtained in the disposition of our public lands. It has gone so far, that now, under the homestead law, only persons who are qualified can acquire title to land, and then not exceeding one-quarter section or one hundred and sixty acres by maintaining residence and improving the property for a continuous period of five years.

The qualifications for a homestead entry are, that the applicant must be the head of a family or a person who has arrived at the age of twenty-one years, and a citizen of the United States, or who has filed his declaration of intention to become such, as required by the naturalization laws; that he must not be a proprietor of more than one hundred and sixty acres of land in any state or territory. To a person in active service in the army or navy of the United States, whose family or some member thereof is residing on the land which he wishes to enter, and upon which *bona fide* settlement and improvement has been made, it is allowed by special enactment that he can make an affidavit to this effect before an officer, commanding in the branch of service in which he is engaged. It is further allowed that a soldier or sailor who has served for not less than ninety days in the army or navy of the United States during the rebellion, and who was honorably discharged and has remained loyal to the government, and who makes a homestead entry of one hundred and sixty acres or less, on any land subject to such entry, to have the term of his service in the army or navy of the United States, not exceeding four years, deducted from the period of five years residence required under the homestead law. If the party was discharged from service on account of wounds or disabilities incurred in the line of duty, the whole term of enlistment, not exceeding four years, is to be deducted from the homestead period of five years; but no patent can issue to any homestead settler who has not resided upon, improved and cultivated his homestead for a period of at least one year after he commenced his improvements. It is necessary for all parties in making application for entry to distinctly state whether they are

native born or naturalized citizens, and no one is allowed to enter upon a homestead claim until he has filed his declaration of intention to become a citizen. In this way our public land will be held only by those who deserve it, and if these methods are carried out, there will be a new significance to the words when we sing

“ My country 'tis of thee,
Sweet land of liberty,
Of thee I sing;
Land where my fathers died,
Land of the pilgrim's pride,
From every mountain side
Let freedom ring.”

TORRENS' SYSTEM OF LAND RECORDS.

By F. T. PYLE, County Recorder, Painesville, O.

[Read at the Farmers' Institute held at Painesville, Lake County, December 16 and 17, 1896.]

It was with some misgivings that I consented to write a paper on the subject which has been assigned me, knowing that generally speaking, people are not interested in questions of this kind, until brought face to face with them in the actual affairs of life. I desire to say in the beginning that I am neither a *lawyer* nor a *judge*, and further, that I am not here for the purpose of finding fault with existing conditions as regards real estate, and titles thereto; neither is it my purpose to defend proposed reforms. I shall simply attempt to show what some of the most common complications are under the present system of transferring land as they have been brought to my notice as recorder of your county (and no one is in a better position to observe these than a county recorder), and then give you a brief abstract of the law known as the Torrens System of Transfers in Ohio, and the principal advantages claimed for it by its framers, and leave it with you to pronounce judgment as to which system you prefer.

The general impression held by the public is, that a warranty deed, as now used under our present law, describes and passes title to a given quantity of land intended to be conveyed so accurately and definitely, that from it there is no appeal, and that if the title is imperfect that the buyer can compel the seller to make the title good; and from the term “warranty deed,” we have some right to so interpret it. But to all who hold that view, I would say “be at once undeceived.” Three-fourths of the deeds recorded in this county are faulty to a greater or less extent. The most common errors are faulty descriptions of the land; in fact, many are so indefinite that it is impossible to locate the land, or determine the amount sought to be sold; it is impossible to tell from many of these descriptions whether the land is in form of a rectangle, a triangle or a circle; to use the dressmakers' parlance, a yoke, a bias or a gore. To illustrate: Jim and John each hold title to land by virtue of warranty deed; Jim claims that John's line is on his land ten feet, and John as stoutly claims that Jim's line is on his land ten feet. They are unable to settle the dispute so they employ a surveyor; they are now going to know just where that line is. The surveyor goes to the disputed land, which is irregular in shape, with indefinite lines,—perhaps no fence to show the former lines,—calls on Jim for his deed, the description in which may read as follows: “Known as a part of lot 12 and is bounded as follows, to-wit: Beginning at a stake side of my barn shed, from thence north on the line of Hezekiah—line to Jacob Pump's south line, thence east on said I mp's line to Wilow Brown's west line, thence along Widow

Brown's west line to the center of the road to a stake, thence north across a potato heap, thence to a stake, thence west on a straight line of the north side of said Jennings's barn shed to the place of beginning, containing, supposed between two and three acres, be the same more or less, but subject to all legal highways." This is an exact copy of a deed recorded in volume A, page 88 of our records. No doubt the surveyor had no trouble in locating the pile of potatoes that had been placed there thirty or forty years before, and probably that barn shed is there yet; the widow Brown's and Hezekiah's lines are easy to find, as well as the stake imaginary in the center of the road. But the surveyor is not yet quite satisfied, so he inquires of John for his deed, the description in which reads: "Being a part of lot 17, bounded on the north by lands formerly owned by John Tuttle, on the west by the center line of the highway, on the south by the south line of said lot, on the east by the east line of said lot, and also the center line of the highway, be the same more or less, but subject to all legal highways." You will observe that in this description there is no amount of land given and not a distance in the description to compute the amount from. This description was recorded in our records Nov. 19, 1896. The surveyor is still in doubt and goes to a neighbor who owns adjoining land and asks for his deed, thinking he may get some light from that. The description in that deed may read: "Beginning five or six rods south of the corn crib at a hickory tree, thence easterly to a chestnut tree on Tisdell's line, thence north on Tisdell's line to the South Ridge road, thence south on said road to the place of beginning, containing about eight acres." The record of this is in volume H, page 565. These are just samples, if you want a job lot, spend a few hours in the recorder's office, and you can get it. It is a common opinion that if lines are in dispute the surveyor can settle it, but no surveyor can establish lines without an accurate description; he may measure such land as is enclosed by a fence, and tell how much is enclosed. So Jim and John can settle their own trouble, or go into court and settle it, which will cost more than the land is worth, and probably both will be dissatisfied with the decision. It is a bad state of affairs when people will insist on describing land by meadows, corn cribs, sheep sheds and piles of potatoes. But land is being conveyed almost every day by no better descriptions than these that I have read. It would be just as reasonable to use some snow drifts and mushrooms to locate the land. Our records now contain and are being filled with a mass of incomprehensive descriptions of land. Many of the parties writing out deeds not knowing what a course and distance, as given in a deed, means, and others not seeming to care for anything but the dollar they collect for making the alleged deed. And again many errors and omissions creep into deeds from copying, under the present system, the description in the old deed being used, and if an error exists it is handed down from one buyer to another. The common expression being "It is the same as I got and I guess that is good enough for you." We have a great deal of carelessness in the execution of deeds. The name of the grantor or grantee many times being omitted, many times not being witnessed, or acknowledged, as required by law, which is in law as much of a fault as a meaningless description. O, but you may say, we have the law of peaceable possession and that if held for twenty-one years passes title. In some instances that is true, in others it is not, and it amounts to about this, that if the other fellow has not a better claim on the land, than you have, you can hold your title, but even then if your description is no better than Jim's and John's you will have some difficulty in finding what you have been in possession of. We also have what is termed the right of equity, which right is recognized and enforced by courts of equity, but has no remedy in the common law. Further, we have provisions in our law to correct defects in deeds, etc. But to hold your title by right of possession or equity requires evidence and proof, and with these faulty deeds, if your title is attacked, the right of possession and equity is your main remedy, which is always an expensive proceeding, and must be decided by the courts. I

understand that it has been decided by the higher courts that even though your title is imperfect that you cannot recover from the party who gave you the warranty deed unless your title has been attacked and you have been the loser thereby. The remedy then would be to bring suit to recover from the grantor of your warranty deed. But if he is not responsible, what benefit would this be? Thus you see it may be that your warranty deed, which should pass absolute title to land, amounts to simply a written statement that the seller had conveyed what interest he had in the land, and is an evidence of good faith on the part of the buyer but not always on the part of the seller.

Now let us consider for a moment some of the claims and incumbrances on land that an owner must satisfy in order to hold his title or to make it perfect:

1. Unreleased mortgages, which are the most common, many of which have been paid but not released of record, while others are still valid liens on the land I think I am safe in saying that three-fourths of the land in this county on which no abstract has been made is covered by mortgages, and probably not more than one-fourth of these represent valid claims. But how is one to know which are paid and which are not, if when they are paid they are not released of record? You may say that a mortgage outlaws in fifteen years. An old lady once addressed another in this manner, "The longer we live the older we grow;" when the other replied, "Some *dew* and some *don't*," and this is true of mortgages outlawing in fifteen years, some do and some do not. If payments have been made on the note the mortgage secures, it may not outlaw in fifty years; and then there are other conditions under which a mortgage might not outlaw in that time. A buyer never knows what is behind an unreleased mortgage.

2. Mechanics' liens, which give the right to one who has furnished labor or material under contract with the owner in building or repairing any buildings that are a part of the real estate, to any time within four months from the completion of the same to take a lien on the real estate, and this lien then dates back to the first day's work and is a first claim on the real estate as against deeds or mortgages that may have been made and recorded during the interim, and mind you that the records would show the property clear in a case of this kind.

3. Life leases or life estates and tax deeds are also claims against real estate and many times cause a great deal of trouble.

4. Land contracts are another source of trouble as our laws at present do not require them to be recorded. But in my opinion it is a very unsafe proceeding for a person to buy land on a contract which is not recorded as there would be nothing to hinder the person giving said contract, from mortgaging or even deeding the land to another, and the person buying the land, or taking a mortgage on the same, would, so far as the records show, have a good title.

5. Tax deeds are titles acquired by virtue of a tax sale, and when passed, if the party holding them so desires, can cause a great deal of trouble to the owner.

6. Leases of real estate for a term not exceeding three years are not required to be recorded, and it is possible for a party who has bought real estate to be unable to get possession of it until said unrecorded lease expires.

These liens which I have just noted, if recorded, can be found in the recorder's office. But for the following liens which also affect the title to real estate to just as great an extent as any that have been mentioned, a search is required in the respective offices. Judgments in court; transcript for liens in the justice's or mayor's court; levies and executions made by the sheriff; tax sales made by the treasurer; and the transfers of land made by will, in the probate office, in fact many causes in probate court affect the title to real estate. It should be borne in mind that the rule which we follow in paying taxes, namely, in June and December, leaves the real estate subject to a tax lien almost the entire year, hence the old adage, "as sure as death and taxes," and from some of the expressions I have heard from parties who have

bought land, on which were tax liens which they were obliged to pay, I am inclined to think that they not only had liens on their earthly home but were creating them on their future home. The general impression of the public is that if you wish to investigate a title to land that the recorder's office will show *all*. This is a great mistake. If you want to know *all* the recorded facts you must not only search the recorder's records but search the records in every office in the court house, and to do this intelligently requires experience. Therefore on account of these complications and errors prudent buyers require abstracts. And generally speaking people have a wrong impression as to abstracts, thinking that if they get an abstract, that that makes their title good. An abstract is simply a condensed history of the land and makes the title no better, but if properly made, shows what the title is as shown by the records, but beyond this, as a rule, it shows nothing, and it is possible for an abstract to be correctly made from the records, and show a first class title of land, that in fact has a very imperfect title. But the common expression is, "I have known that land for fifty years, and it's all right." I have heard statements made similar to this, repeatedly, and some of the worst complications I have ever seen, was the title to land that some one *knew* was *all right*. You think you know but you *don't*. It is a difficult matter for one to tell what he himself has done for fifty years that would affect title to land, saying nothing as to what his neighbors have done that would affect their title. There is not now, outside of the Torrens law, and never has been any law in Ohio, requiring record evidence to be made of who are heirs of a deceased person and to whom his land shall descend therefrom. Purchasers of property which has thus descended must either take what they get without question, or depend on evidence outside of the public records, that they are getting the interest of all the heirs. It is estimated that on land on which the title has not been cleared from defects, that not more than one in ten titles is wholly free from them, and that seven out of ten has one or more, and about one-fourth of all the titles are so defective as to be incurable, and that as many as seven out of every ten land owners believe their titles free from defect; as a rule the less a man knows about his title, the more positive he is that it is perfect, and he does not realize his situation until he has a desirable opportunity to sell, or is in need of a loan and the deal is stopped by reason of these defects; and if he does not entirely miss the sale or loan by reason of this, he will have been put to a great deal of trouble, and sometimes to considerable expense. When a defect in title is pointed out to the average man, and sometimes to a lawyer, it is very apt to be treated as a trifling thing, unworthy of attention. And many times these apparently trifling defects cut an important figure in the fortunes of those who ignore them.

Another source of trouble and expense, not only to the recorder but to the public, is the loose way in which allotments have been treated; many have never been recorded at all, and land is being conveyed to this day by those lot numbers of allotments that were made, perhaps fifty years ago, and not recorded, then perhaps after a few years a new allotment has been made of the same land, with entirely different divisions of the land, and perhaps in a few years still another and some of them recorded, and some not. The township of Painesville is notorious for this state of things, and in some instances we have four or five allotments of the same piece of land and the lots and streets in no two of them are alike, and then to add to the confusion the land is not occupied or described according to any allotment. The result of all this is that the most valuable information in reference to allotments and surveys many times has to be obtained outside of the public records, and the expense of searching a title in these cases is largely increased.

The law known as the Torrens law is not a new system of transferring land, and has been in use successfully for many years in different countries. It is designated in this state as the Ohio Torrens Law. The intention of the framers being to make the law correspond as nearly as possible to the present laws of Ohio and embrace

the best features of the Torrens system. It should not be confounded with the so called Torrens law of Illinois, for the two laws are entirely different in many respects, the main one being in the Ohio law to obviate the judicial powers conferred on the recorder in the Illinois law. The objects of the law as claimed by its framers are:

1. To give an absolutely indefeasible title to land, the title to said land being actually defended by the state.

2. To afford an easy means of removing from titles defects, which may not be fatal, but which are troublesome clouds.

3. To provide a method of conveying land with absolute security to the buyer, and with nearly as little trouble to the buyer or seller as personal property is now conveyed.

4. To require an accurate description of each piece of land brought in under the system.

5. To bring all the record facts pertaining to land into one office, and to be shown on a single folium of a book, known as a land register, thereby simplifying the search of titles.

6. To exclude the present system of conveying land by deeds and to convey the same by certificate of title, from the recorder, as shown by the land register.

7. The law confers on the probate court in each county for the purposes of this act, all the powers of a court of equity and a court of general jurisdiction.

The following is a brief abstract of the requirements in order for owners to adopt it.

- I. An owner of real estate, who desires to take advantage of the system, makes application in writing, in presence of two witnesses, to either the common pleas or probate court, furnishing all deeds, surveys, maps, etc., in his possession also the names and post office addresses of all adjoining property owners and present occupants. The application must contain an accurate description of the land, the amount, nature and kind of every incumbrance; all easements and inferior estates to the fee simple either in law or equity; names and post office addresses of all persons interested in the land.

- II. The court then fixes day for hearing, and the applicant is required to give notice for four weeks by publication, which must contain an accurate description of the land, that application to have said land registered has been made; all person holding claims against said land are required to give notice in writing to the court of the nature and kind of said claims.

- III. The court, or referee appointed by the court, may require the applicant to file a *complete abstract*, or where boundaries or amount of land are in dispute, may require a survey and accurate plat of the land.

- IV. If any defects are found in the title they must be removed before the land can be registered.

- V. The court, if satisfied, can then order the land registered, and enters the same on the land registration docket, and files the decree and order for registration with all papers, with an accurate description of the land, maps, surveys, etc., with the recorder, who gives a receipt for them. The recorder indorses thereon the exact time of filing, and number of the paper which must correspond with the folium of the register and files the papers in his office.

- VI. The recorder then registers the land, showing all incumbrances, liens, etc., thereon, also the exact time when made, name and address of the owner, etc., with a full and accurate description of the land, and issues a duplicate to the owner which must show volume and page of register. Incumbrances and liens must be noted as to priority. He must also make a copy of all surveys in the record of surveys, the volume and page of the record of survey must be noted on the register, also on

the owner's certificate. The lands registered must be entered in the tract indexes in the numerical order of townships, ranges, lots, sections and subdivisions.

VII. No transfer of registered land shall be made by the auditor, but the recorder is required to make out a list of all transfers before the first day of May each year, for the year ending on the second Monday in April.

VIII. All certificates surrendered and cancelled shall be filed by the recorder and must be accurately dated.

IX. Persons not having had actual notice may begin suit in the court where decree was entered to establish his right any time within five years, but this does not affect *bona fide* purchasers nor disturb their rights.

TRANSFERS.

I. An owner of registered land who desires to transfer all or part of same must endorse on, or attach a transfer to his certificate, if married, must give name of wife, the consideration, the name of the parties to whom transfer is made, with the post office addresses of all parties, and, if transferring part of his land, an accurate description of the land, subject to such liens, mortgages, estate, etc., as are noted in the register at that date with statement of surrender of certificate and a request to the recorder to issue certificate to party named. The transfer must be acknowledged.

II. When such transfer is presented to the recorder he shall file the same, and if he shall find that the transferer is entitled to make such transfer and that the transferee is entitled to have the land registered, he shall cancel the old certificate and register the title upon a new page of the register and enter thereon all memorials, notations and memoranda to which the land is subject. When a certificate is wholly cancelled the same is retained by the recorder and a new certificate issued to the transferee showing all incumbrances, etc., as is shown on the register.

III. Every transferee, mortgagee, lessee and encumbrancee of registered land holds his title subject to the mortgages, encumbrances, etc., that have been entered on the register prior to such transfer of the land, mortgage, etc., unless it is otherwise expressly provided.

TRANSMISSION AND ADMINISTRATION.

I. Whenever any person dies owning land, or any estate therein, the land shall pass to the personal representatives of the estate of the deceased, whether he die testate or intestate, and the same shall be administered in like manner as personal property, except as otherwise provided, and except that distribution shall be made according to law in force, covering descent and distribution, or as shall be provided in the will of such deceased owner.

II. When a person dies owning in fee simple any unregistered land his executor or administrator, after being duly qualified and before dealing with such land, may make application to have the same registered.

III. Before any sale of registered land can be made, proof of heirship shall be made in probate court where proceedings are pending, and before any transfer can be made a certified copy of such proof must be filed with the recorder and such copy shall be conclusive proof in favor of all persons thereafter dealing with the land, that the persons therein named are the only heirs of the deceased owner.

IV. Whenever it is necessary to sell lands registered in the name of the personal representative, to pay debts or devisees of a deceased owner, sales must be made as is provided by law in reference to the sale of real estate of deceased owners to pay debts, and upon the sale being made the personal representative shall

make application to the probate court of the county where the land is situated for an order to have the lands registered.

V. The probate court has the same jurisdiction over real estate that it now has over personal estates. No land registered in the name of executor or administrator, can be sold without an order of the court.

MORTGAGES AND ENCUMBRANCES.

I. When registered land is to be mortgaged, the mortgagor shall execute a memorandum of mortgage in any form recognized by law, which must contain an accurate statement of the estate or interest to be mortgaged or encumbered, etc., and must refer to the certificate of title and such other description as may be necessary to identify the land.

II. The recorder, on the filing of such incumbrance in his office and the production of the certificate of title, being satisfied that such person has a right to place such incumbrance, and that the person in whose favor it is issued is entitled to receive the same, enters a statement on the register of the amount, nature of encumbrance, date of filing, and its file number, and also notes on the instrument the volume and page of the register; the same entries must appear on the certificate of title, and the recorder must take and preserve the post office addresses of all parties interested. The incumbrance is not recorded unless the party filing the same requests it to be done; if recorded the party owning the mortgage, etc., may take the original, otherwise the recorder keeps the mortgage in his possession.

III. If the owner of such mortgage desires to sell or assign the same or any part thereof, he must endorse on the original, properly acknowledged, the assignment; if transferring part, he must state what part is assigned and state whether the part transferred is given priority, or rank equally with the remaining part; the assignment is then filed with the recorder, with the instrument held by the assignor. The recorder upon being satisfied shall enter said assignment on the register, and upon the instrument a statement of the amount, date of transfer, name of transferee, rank and file, number of volume and page of register. No assignment is to take effect until filed, and the recorder shall file and preserve the assignment. If the transferee desires a copy of the assignment, the recorder shall make a certified copy, which shall contain the names and post office addresses of all parties interested.

JUDGMENTS AND LIENS.

I. No judgment or decree of court shall be a lien on registered land or any estate therein, until a certificate made by the clerk of the court stating the amount of judgment or claim, names of plaintiff and defendant, volume and page of the journal, or a certified copy of judgment or other action of the court stating the facts, is filed in the recorder's office and memorial of the same is entered upon the page of the register where the land is registered.

II. No statutory lien or other lien shall affect registered land until memorial is entered on the register.

III. When registered land is levied upon, or seized by virtue of any writ of attachment, execution, or other process it shall be the duty of the officer making such levy, forthwith to file with the recorder a certificate of the fact of such levy, which is forthwith entered on the register. No levy, attachment, etc., shall operate as a lien on registered land until said certificate is entered on the register.

IV. Transcripts for lien from the docket of a justice of the peace or mayor must be filed in the clerk's office. The party filing the same is required to notify the clerk whether the land upon which the lien is sought is registered, and if regis-

tered the clerk issues a certificate of such transcript or lien which said party must file with the recorder, who shall enter the same on the register, and no lien shall attach to registered land until such certificate is filed with the recorder.

V. No pending suit in any court affecting registered land shall operate as a lien until a certificate of same, under seal of the clerk of the court, is filed with the recorder, who must enter the same on the register.

Assignees, master commissioners and receivers are required by the act to make application for register of any land of which they have control.

Powers of attorney, and trust deeds affecting registered land must be recorded and a notation made on the register showing volume and page of record, where recorded and nature of trust, etc.

Holders of tax certificates on registered land shall forthwith present the same to the recorder who shall make the proper entries upon the register.

Tax deeds of registered land must be filed with the recorder within sixty days after date and have thereon an order of the court stating that said deed may be registered.

ASSURANCE FUND.

Upon the first registration of land there shall be paid to the recorder one-tenth of one per cent. of the tax value of the land, for the purpose of an assurance fund of the land, which the recorder shall pay over to the county treasurer on the first Monday of each month. The treasurer is required to invest this fund in bonds or other like securities for the benefit of said fund. This fund is to be used for the protection of persons deprived of their rights, etc., in the land as is required in the law. There shall be no action against this fund beyond ten years.

The recorder is allowed a fee of one dollar and fifty cents for first registration. For examining and registering transfer two dollars and fifty cents, for filing a mortgage and making memorials, indexing, filing names and addresses of parties interested twenty-five cents; for each certificate showing condition of register one dollar and fifty cents; for cancellation of any memorial fifteen cents, for filing first registration papers ten cents. All other fees are the same as are now allowed.

The act took effect September first, 1896, but no application can be filed until the second Monday in January, 1897.

No attempt is made in this abstract of the law to explain many of the details as regards assignees, receivers, estates, etc., the object being to give a general idea how land is conveyed by the law and the more important effects of same. It should be noted that the recorder's land register is the principal book kept by him and the title passes subject to such incumbrances as are thereon shown. The other books that the recorder is required to keep that would interest the public are, the tract indexes, alphabetical indexes, and record of surveys. It is entirely optional with land owners to accept or not, the Torrens system, except in the case of assignments, receivers, etc. Abstracts are not done away with, but in many instances would be required by the court. The general impression of the public is that the system is very simple and it is so far as it applies to the buyer or seller but by reading the law carefully one may readily see that it will require considerable time for the recorder to make out the necessary papers and notations as required by the law. In fact all the complications of conveying land are transferred to the recorder. The transfers of land and certificates of title cannot be consummated in a few minutes' time. As regards the recorder, his work is multiplied tenfold, and he is held personally responsible for any error or omission on the register, and the fees he gets are no more than he now receives. The keeping of tract indexes, as required in the law, will involve an endless amount of work and some surveying, before the recorder can make up such an index as would be of any use to the public. The survey of the Western

Reserve is much more incomplete and indefinite than the surveys of congress lands which are laid out in sections and quarter sections and would be nicely handled in the tract indexes, but when we have tracts containing a thousand acres or more and no subdivisions of the same, it is an open question as to whether the Torrens system can be successfully and intelligently carried out with reference to these tracts as was intended by the law, without an endless amount of trouble, and the establishing of many of the lot and tract lines. The law requires the recorder to keep and use seventeen books and blanks, and on the first registration of land, the least number of entries required is twenty-six. In many instances this would be increased to fifty, besides the filing of the different papers he is required to keep. To transfer land the least number of entries required is fifteen, and this is also liable to be increased to fifty.

On the filing of a mortgage or other lien the least number of entries required is ten, and this is liable to be increased to twenty-five.

The law intends to confer no judicial powers on the recorder, but if he makes an error in any entry on the register he can summon witnesses and examine them in reference to said error and if no party has been the loser he can correct the error. If the description of land transferred or registered is so faulty that he is unable to carry the same on the books, he can order a survey of same. In this county the recorder is required to give an additional bond of fifteen thousand dollars.

OUR PRESENT ROAD SYSTEM.

By N. HART, Chesterhill, O.

[Read at the Farmers' Institute held at Chesterhill, Morgan County, January 25 and 26, 1897.]

While I do not claim that our present system is the best, or even as good as some other that might be adopted, I do assert that if all of its branches were judiciously administered, there would be a gradual improvement that would eventually procure good roads without being over burdensome to the taxpayers.

The first essential in any system of road management and work is the means necessary for its successful prosecution. Our present system provides amply for this. The resources that our laws provide for securing funds to be expended in the repair and improvement of our public roads have not as yet in any one year been half exhausted. In fact the people would not want to be taxed for road purposes to the full extent of the provisions of our laws. In addition to the two days' labor the commissioners can levy each year three mills for a cash road and bridge fund, beside a fund to be paid in labor, and a fund to be used in establishing grades on our leading roads.

The trustees may levy each year three mills to be paid in labor and one mill in cash in addition to a bridge and culvert fund, and a fund not to exceed two hundred dollars for the purpose of cutting down banks and repairing washouts, making in all some eight or nine mills that could be levied on each dollar of taxable property in the county. The assessed value of the property in this county being about seven million dollars, there could be about sixty thousand dollars raised each year for road purposes in addition to the two days' work, besides other special provisions, such as authorizing the commissioners to build bridges or repair them and issuing bonds on the county to pay for it, and each year following to make a levy to discharge the interest and a certain portion of the principal until they are finally lifted; and the law authorizing the trustees of any township, upon the presentation of

petition signed by one hundred taxpayers, to hold an election submitting the question of piking or gravelling a certain portion of its roads to the qualified electors of the township. The value of this township's property being six hundred thousand dollars, it could be taxed about five thousand dollars for road purposes without resorting to the special provisions.

Next comes the proper location. Our leading roads should, as nearly as practicable, be made to conform to an established grade as fast as the convenience of the county will permit. It should be the duty of every commission sent to view a proposed route for a new road or the alteration of an old one to ascertain, first, whether the convenience of the people along said route and the travel of the public in general require a road, and if not so found to report the same to the commissioners and stop the expense there; but if found necessary they should carefully inspect the ground to which the petition confines them to ascertain whether a road could be constructed with a reasonable amount of expense. After deciding upon the route they should report the amount of compensation and damage (if any) that each land owner should receive, together with a plan of the road and approximate cost of opening it, that the commissioners may act understandingly in regard to granting or refusing it. Let us here caution petitioners and those interested to be careful about applying for damages, lest it give the impression of a scheme to get a lick out of the public trough.

The next thing to consider after roads are located on the best grounds accessible that will accommodate the travel required of them, is their repair and improvement. To accomplish much in this I insist that there must be cooperation and good, efficient work done in all departments, from the commissioners, trustees and supervisors to each individual. If we could secure as prompt performance of the duties imposed by our road laws, by each individual that has two days' work or taxes to be paid in labor, as a good farmer or a careful business man gives his private business, the roads of our county could be greatly improved without levying any more taxes than the average of the last ten years. I think it a good plan, if each fund were properly used, to levy the road taxes to be paid partly in labor and partly in cash so that each department may make some permanent improvement. The commissioners, trustees and supervisors should each, as a rule, after the necessary repairs in the way of cleaning out ditches and drains, mending culverts and bridges, filling up holes in the road bed, rounding up roads, etc., make some permanent improvement, such as cutting down the high and filling in the low places, moderating a heavy grade, tile draining or macadamizing some bad piece of road. Let the commissioners make their improvements where most necessary to best accommodate the travel of the county, the trustees make theirs where it will best accommodate the travel of the township, and the supervisors make theirs where it will best suit the convenience of their districts.

One other thing in regard to taxes; there should be more uniformity in our township levies, which might be brought about through a meeting of the county commissioners and the trustees of the several townships. While some townships make good, liberal levies, others levy scarcely anything for road purposes, and then expect the commissioners to expend a part of their cash road fund, in repairing roads, which should be used in making some permanent improvement. Much depends upon the supervisors, as they have full control of the two days' work and the taxes paid in labor. It is not so easy to get value received out of the labor fund as it is out of the cash, and for this reason we should see that the right men fill the office of supervisor. Elect men who know how to do road work, and are not afraid to do it, and who will not receipt for a day's work until they know one honest day's work has been done.

One of the best means of securing good roads is by grading them to a crown; that is by gradually raising them from the outside of the road bed to a full, rounding

center; and to do this when it should be done, it would be necessary for each township to have two good road machines, and a convenient number of scoops and plows. All grading should be done as early in the spring as the roads become dry enough for the machines to work well, because if left until they become dry and hard there cannot be much good accomplished. If it should be wet and rainy after the grading has been done, and the roads become cut up and rough, they should be smoothed over again with the machine. Where the road is fenced forty feet in width do not commence at the fences with the ditch, draw the dirt part way to the center and leave it making a trough in the center of the road bed to hold the water and cause mud holes; but commence at a fair width and draw the dirt to the center leaving the road crowning in the middle. If a road is fenced fifteen feet wide throw out the fence and place the ditch where it should be. Never make a ditch that you do not furnish an outlet for; if you do it will fill with water to soak into the road. Follow the machine with hands; open all drains, crossings, culverts and outlets; throw out all loose stone and lumps, and take out all protruding fast stone and roots.

I am not in favor of stoning clay or sandy roads, but waxy or miry places I would stone and do it well. Do not allow one man to put in all his road tax by hauling stone to some place where it is not needed expecting some other man who has a team to break it, for if you do, you will be left in the lurch and the stone will be left in the ditch, to stop it up and for horses to blunder over when hidden by drifted snow. Do not put a load or two of halfbroken stone in a mud-hole, or put two or three inches of half broken or crushed stone on a strip of road to mix with the mud in winter and shake vehicles to pieces in summer, but when thought necessary, after the place is properly drained, put on not less than six to ten inches of well broken or crushed stone. Stone needs to be fine enough to cement together.

In regard to culverts, I think tile the cheaper and better material if properly used. It should be used where the road is thrown up sufficiently above the bottom of the ditch, to allow the tile to be covered with gravel, shale or stone, made strong so that heavily loaded wheels will not strike and break it, and deep enough not to freeze; but, where it will not admit of sufficient covering and allow the water to drain out, use plank. In crossing ravines use the larger tile. Be careful to bed and cover it evenly so that the weight may not strike on one corner of a stone, but bear evenly over the whole piece and it will be all right.

In conclusion, I would say that in my estimation the trouble with the improvement of our roads is not so much the fault of our system of road laws as it is the fault of the people. Let the people become awakened to a conscientious discharge of the duties imposed upon them by our present road system and our taxes need not be burdensome to greatly improve our roads; but, if each one tries to see how little he can do to discharge the obligation, you might increase the taxes to the full extent and the improvement would be very slow.

TAXATION.

By JOHN A. DEINDORFER.

[Read at the Farmers' Institute held at Defiance, Defiance County, December 9 and 10, 1896.]

Death and taxes you cannot escape. They will meet you at some turn in the road of life. You may escape death temporarily by calling to your aid medical science and without being subjected to a penalty; but if you escape taxes or taxa-

tion for a time, whether inadvertently or intentionally, it will result in the imposition of a heavy penalty. It would seem that, in view of this fact, no man will fail to thoroughly familiarize himself with at least the most important laws pertaining to taxation. Yet such is not the case, and the inevitable result is pecuniary loss to the taxpayer, not to speak of the many and serious annoyances and inconveniences to which violators of the tax laws are subjected. It is, therefore, in my opinion, of vital importance that this subject should become the topic of a more general discussion, and I hope that what I may say to-day will assist in bringing about such a result.

There are various kinds of taxation, only brief reference to all of which, save one, will be made in this connection, as we have only the one system to engross our attention at this time. That taxes are indispensable goes without saying. They have been levied from a "time when the memory of man runneth not to the contrary." Money must be raised to administer the affairs of the nation, the state, the county, the municipality, the township and the school district.

The revenues, which is but another term for taxes, necessary to properly administer the affairs of the nation are in part obtained by levying duties upon imports, which system has been most exhaustively discussed by the great political parties in the last decade. In part they are obtained from internal revenue duties on alcoholic beverages, tobacco and its products. And another system, in vogue in many of the foreign countries, but which failed of being in accordance with the constitution of this country, is the income tax. Import duties and revenue duties, or import taxes and revenue taxes, are termed indirect taxes.

The necessary means, however, to administer the affairs of the several states, the counties, municipalities, townships and school districts, are raised and obtained in a direct manner, that is, by levying on all the real and personal property, with a very few exceptions, within the limits and confines of the territory named, a certain stipulated amount, for the payment of which the property upon which such taxes have been levied can be held, confiscated and sold to satisfy the claim, thus operating as a lien in all that the term implies.

The value of your real estate and personal property, the latter commonly called chattels, is fixed by the appraisers and assessors. The appraisal of real estate for purposes of taxation occurs decennially—every ten years—and the person to whom this important task is assigned and entrusted is elected by your votes. The county is divided every ten years by the county commissioners at their June session into such districts as they see fit to create, the number of which, however, not to exceed the number of townships in the county; and none of the city districts to comprise less than one nor more than five wards. If the commissioners create these districts at their June session, then the election of the appraisers occurs at the next November election. If they make the districts at a later time, such election takes place on the first Monday in April of the following year. The appraisers having been elected, and having qualified according to law, proceed by actual view to fix and establish the value of your real estate, not only the land, but all the buildings contained thereon. In his work the appraiser is assisted by all the necessary data to expedite his work and make it as correct as its importance would warrant, which data are furnished him from the office of the county auditor. That only men of honor, integrity and good judgment should be elected and selected to fulfil so important a mission, is apparent; whether such has been the case always in this county is not for me to say. You are better judges of this than I am. I can state, without fear of stepping on any person's tender toes, from personal experience and from close observation covering a period of over three years, that there are many cases of gross inequality in valuations; and I am quite certain that especially city boards of equalization will corroborate this statement, as they are called upon every year to correct errors of the most flagrant nature.

The appraisers make their reports to the county auditor in detail, setting forth name or names of owners, descriptions of lands, number of acres under cultivation and number of acres not tilled, buildings, etc., etc., appraising each separately. Their report is due on or before the first Monday in July. Every person, whose real estate has been appraised, must be furnished a statement of such appraisement by mail or otherwise. This is done so that those having cause for complaint may appear before the decennial city and county boards of equalization to show good cause why their property should not be appraised as set forth in the statement. The reports of the decennial appraisers, so far as they pertain to farm lands, are submitted, for the very important purpose of adjustment and inspection, to the decennial county board of equalization. The auditor, surveyor, and the county commissioners constitute this board, and they meet on the second Monday in August after the appraisement. The reports in the cities are inspected and equalized by a decennial city board of equalization, composed of the county auditor and six citizens appointed by the council. This latter board begins its labors on the third Monday in September after the appraisement. Both boards have power and authority to raise and to reduce valuations, but in no instance have they any legal authority to reduce the aggregate or the sum total returned by the decennial appraisers.

After these boards have discharged their duty, the county auditor submits the reports of the decennial appraisers as inspected, adjusted and equalized by the local decennial boards of equalization, to the auditor of state. At Columbus these reports undergo their last process of adjustment at the hands of a decennial state board of equalization, consisting of as many members as there are state senators in the legislature of the state, whose election must have taken place at the November election in the year next preceding the year in which the appraisement is made. The decennial state board meets on the first Tuesday in December after the appraisement. The rules laid down in law for its guidance are far too numerous to be quoted even briefly in a paper like this. Its work having been completed, the property lists are returned to the county auditor, and from them he makes up what is known as the real estate duplicate, all levies and tax computations being based on the valuations finally settled by the action of the Decennial State Board. These valuations remain, or should remain, unchanged for ten years. Gross inequalities, sufficiently glaring to be termed errors, may be adjusted or corrected by the annual city and county boards of equalization from year to year, but they can in no case reduce the aggregate and can only deduct from one and add to the other. When there is an apparent error, the auditor may, with the consent and by order of the county commissioners, remit, that is, drop, or refund, that is, pay back, all taxes erroneously assessed, and the auditor of state may, and in numerous instances does, order corrections made. New structures come under the head of real estate and are appraised by the township and ward assessors at the time when the appraisement of personal property is made. Deductions becoming necessary by the destruction of structures by fire or otherwise are also reported to the county auditor by the assessors of personal property.

That the appraisement of *personal property* must take place more frequently than that of real estate is self evident, from the fact that it is readily movable, perishable and subject to more rapid fluctuations in value either by changes in the market prices or by additions and deductions. The appraisers of this property are styled assessors, and they are elected by wards, townships and township precincts annually at the spring elections. They meet as soon as they have qualified, with the county auditor and there, in addition to receiving the necessary blanks, books and instructions, usually agree upon a certain basis of valuation. The object of this procedure is to appraise credits, farming implements, live stock, household goods, products of the farm, merchandise and all other property which comes under their jurisdiction,

as nearly equal and as justly as possible. Railway property, the property of incorporated companies, such as factories owned by joint stock companies, telegraph, telephone and express companies and banking institutions, are not under the jurisdiction of these assessors. Railroad property is appraised by the auditors of those counties, through which the lines extend and are finally adjusted by a state board consisting of the auditor of state, treasurer of state, and attorney general. Bank corporations make their returns for taxation on a special blank form, as do also manufacturing joint stock companies and fire and life insurance companies. The returns of banks are equalized by a state board, composed of the governor, auditor of state and attorney general the other reports come under the scope of the local boards of equalization. Reports of telegraph, telephone and express companies are also adjusted by a state board. With the methods employed by the township and ward assessor you are all familiar. His annual visit fills you with delight. You make his arduous task lighter by readily and without hesitancy imparting to him all the information in your power. This, no doubt, is true of many. Whether it applies to you I leave to the voice of your own conscience. There are those who invariably tell the assessor: "You can see what there is, list it yourself." In this way, which the law does not contemplate or even countenance, many errors must occur, and when the time for the payment of taxes arrives, there is no end of trouble. The better way, in fact the only correct and proper way, is to fill the blank out yourself, or at least to dictate to the assessor the valuations you place upon the various articles comprising your chattel property. The law provides, however, that while no real estate, excepting that used for religious, charitable, public and educational purposes, shall be exempt from taxation, each individual residing in Ohio may deduct a sum not exceeding one hundred dollars as exempt from taxation from the aggregate listed value of his taxable personal property of any kind, dogs excepted. Make up your list for the assessor, deduct the amount exempt, and jot the sum total down in a diary or memorandum book for important reference when you get ready to go to the treasurer's office to pay your taxes. The assessors make their returns to the county auditor on or before the third Monday in May. These reports are then submitted to a county board of equalization, made up of the auditor and the county commissioners, for the purpose of equalizing valuations of chattels in townships and villages. This board meets on the first Wednesday after the third Monday in May. The reports from the cities are adjusted by a city board of equalization, consisting of the auditor and six citizens appointed by the council. Both boards have power to hear complaints and to equalize valuations of real and personal property; but they cannot reduce the aggregate value of real estate as fixed by the state decennial board. And they shall not reduce or increase the valuation of any real estate, except in cases of gross inequality and then only upon reasonable notice to all persons directly interested, and an opportunity must be given for a full hearing of the question. The two boards having completed their work, the auditor is at liberty to enter the lists of personal property on the tax duplicate and to make the computation of taxes.

In this connection, it may be well to state that all properties, according to law, should be listed at their selling price. Very little attention seems to be paid to this rule, and to this deplorable fact are due many, yes, most of the inequalities of taxation. If all properties were listed as the tax laws contemplate, an almost equal distribution of the burdens of taxation could be attained; and the rates of taxation would be lower in proportion than now. It is possible that such a condition of affairs may be brought about, but this cannot be considered probable, so long as taxpayers persist in electing assessors of at least questionable judgment and then shift onto them the responsibility of an honest and fair return of chattel valuations for taxation. So long as the present system of assessing and listing personal property is in vogue, just so long will there be gross injustice in taxation and just so long

will the tax burdens fall heaviest on the shoulders of those possessed of a moderate amount of the good things of this world.

While appraisers and assessors and the various boards of equalization were busy fixing and establishing the exact amount of the *multiplicand*, the general assembly, the county commissioners, the council, the township trustees and the school boards have set about to furnish the multipliers. In other words, they have fixed the rates of taxation. Each has ascertained what per centum will be required to administer the sundry and divers affairs of their respective localities. This per centum, commonly called levy, is based on the valuation supplied by the appraisers and assessors, and is limited by legal provision. They are furnished to the county auditor, who arranges them in tabular form, and then he has the correct rates of taxation for that particular year for every municipality, township and school district in his county. He multiplies the amount of your real estate valuation with the rate of taxation in your city, township or school district, and the result is the amount of your real estate taxes. The same process is gone through with the valuation of your chattels; as a result he has the amount of your chattel tax. If you have a male dog, he adds one dollar; if a female dog, two dollars to your list.

You will notice printed in your county paper—and no taxpayer should be without such a paper—the rates of taxation in the fall of the year. These rates enable every taxpayer, by simple multiplication, to correctly compute the amount of taxes he will be required to pay in December and in June. I advised you to make a note of the amount at which you listed your personal property. Look up this amount and put it down on a slip of paper, add to it the amount at which your real estate is appraised; you will find it on your last tax receipt. Then look up the rates of taxation in your newspaper, pick out your township, city or school district and take the figures found in the column under the head, "Half less road." Add to this the amount you find under the head, "Township road," in your locality, because the full amount of township road tax must be paid in December, and you have the multiplier with which to ascertain the amount of your December taxes. *Multiply by this "half less road" plus "township road" the valuation of your real estate and chattel property, and you have the exact amount of your December payment of taxes.* If you own or harbor a male dog, you will have to add one dollar for him; if a female dog, add two dollars. To find your June payment simply multiply your valuation by the figures for your township under the head "Half less road" and the result will be your June payment of taxes.

To illustrate, suppose the valuation of your real estate to be seven hundred dollars and that of your chattels three hundred dollars. In your township the "half less road" rate of taxation is, say, 11.10 mills and the road is 3 mills. Now multiply your valuation—one thousand dollars—by 11.10 plus 3.00 which is 14.10. The result is fourteen dollars and ten cents, which is the amount of the December payment of taxes for your township on a valuation of one thousand dollars. The rate for the June payment will be simply 11.10, because the road was all included in the December payment. Multiply the one thousand dollars by 11.10 and you have eleven dollars and ten cents, the exact amount of the June payment in your township on a valuation of one thousand dollars. Every man and woman, and even school children in the lower branches can compute taxes just as correctly as can the auditor, and every taxpayer should do so as carefully and with the same degree of business tact that he employs in figuring the interest on his mortgage, or the various expenses incurred in his household or on his farm. It will pay you to do this. You will always find yourself supplied with the requisite amount of money when you call on the treasurer, and if a mistake has occurred on the books it can be traced then and there much more readily than two or three years later, when perhaps some of the papers have been lost or a change has taken place in the office where the error originated.

WHEN TO PAY TAXES.

In my judgment this is to you the most important feature of the tax question, for here the most errors occur and the greatest losses are wrought to the individual taxpayer. You may feel tempted to say, the time to pay taxes is when you have the money to do so; or in December and June. It is true that taxpayers generally know when taxes are being taken, yet a very large percentage of them are paying 10 and 15 per cent. penalty year after year, and in most instances they are not aware of it. Why? Because they do not fully understand the tax system and are apparently too indifferent to their own interests, or too busy, to acquaint themselves with it. Many persons pay their taxes but once a year—for a full year to be sure—but in by far the most instances for the last half of the past year and the first half of the current year. By doing this, they invariably are charged up with and pay 15 per cent. penalty on the last half of the past year on their real estate, and 10 per cent. penalty on the last half of the past year on their personal property. *There is still another very bad feature about this way of paying taxes*, and this has been the cause of not only much annoyance, but also of a great deal of bad feeling among the taxpayers, many of whom labor under the incorrect idea that they are being made the victims of extortion. *The trouble is this*, where taxes are paid in the manner indicated the June payment goes delinquent on both real and personal taxes. With reference to the real estate taxes this delinquency cannot be overlooked, because it is carried over to the *general tax duplicate* for the following year and is charged against the real estate for that year. *Not so with the personal delinquency*, this is carried onto a delinquent personal tax book—a separate volume. Frequently, when a taxpayer calls to pay, the treasurer does not take the precaution to look him up in the personal delinquent record, and a year or two later the taxpayer receives a notice from a justice, or some person appointed as a collector, that he owes delinquent personal tax and must pay forthwith to avoid costs. Well, we will pass over in silence the various, and more forcible than elegant, expressions which these notices elicit; and yet the entire trouble is due just as much to the carelessness of the taxpayer as to that of the treasurer. That you may form some idea of the large amounts of penalties collected annually in this county, let me cite you to the last settlement sheets in the auditor's office for August, 1896. There was paid in penalties at the last June collection the sum of one thousand, four hundred and thirty-one dollars and thirty-six cents, distributed as follows:

Defiance City.....	\$948 29
Defiance township.....	64 71
Delaware township.....	24 78
Sherwood village.....	12 32
Hicksville village.....	94 61
Hicksville school district	3 46
Hicksville township	11 09
Milford township.....	34 49
Farmer township.....	15 08
Washington township	21 95
Ney village.....	5 13
Tiffin township.....	37 07
Adams township.....	11 29
Richland township	13 40
Highland township.....	30 28
Ayersville school district.....	10 45
Noble township.....	31 71
Mark township.....	58 97
Mark school district.....	2 38

At the December collection of taxes in 1895, covering the first half of that year, the penalties paid exceeded one thousand, six hundred dollars, making a total of over three thousand dollars for the year 1895. This is about the average paid each year in penalties; yet, in almost every instance this is an unnecessary expenditure of money. There are undoubtedly many cases where there is a lack of the money to meet the tax payment, but even in such cases it is, from a business point of view, a poor speculation to pay twenty or 30 per cent. penalty or interest, *for that is what it amounts to*, to the county, when you are enabled to obtain money from other sources at 8 per cent. Paying fabulous rates of interest may be patriotic and a good thing for the county, but it is folly and a hard thing on the pocketbook. Not a few men carry their negligence, if you will pardon me for using this seemingly harsh term, to a still higher mark; they permit their real estate to go delinquent and to be advertised and sold, in which event they must pay a penalty of 15 per cent. to reclaim their property. Others even reach the utmost limit; their property is forfeited to the state for the nonpayment of taxes and is sold at a forfeited land sale. In such a case they are required to pay a penalty of 50 per cent. to redeem their property. It seems almost incredible, and yet it is shown by the records, that there were sold in this county in December, 1895, and January, 1896, about fourteen thousand dollars' worth of tax claims, to redeem which the owners of the property, on which these claims are a lien, will be compelled to pay in taxes and penalties and other expenses incidental to these sales and transfers, between twenty and twenty-five thousand dollars. And yet most of this trouble and enormous expense could be avoided by a full understanding and strict observance of the tax laws. The tax delinquencies in this county are enormous. At the last settlement in September, 1896, there were unpaid taxes in this county amounting to sixty-five thousand, five hundred and fifty-eight dollars and eight cents, distributed as follows:

Defiance city, real, \$34,739.51; personal, \$8,888.71.
 Defiance township, real, \$1,125.63; personal, \$197.36.
 Delaware township, real, \$1,251.49; personal, \$89.94.
 Sherwood village, real, \$1,016.51; personal, \$381.33.
 Hicksville village, real, \$2,377.09; personal, \$339.68.
 Hicksville school district, real, \$31.73; personal, —.
 Hicksville township, real, \$794.31; personal, \$230.51.
 Milford township, real, \$1,362.59; personal, \$150.64.
 Farmer township, real, \$683.02; personal, \$123.90.
 Washington township, real, \$881.59; personal, \$474.65.
 Ney village, real, \$182.02; personal, \$114.74.
 Tiffin township, real, \$1,010.79; personal, \$224.71.
 Adams township, real, \$330.38; personal, \$122.37.
 Richland township, real, \$992.73; personal, \$302.79.
 Highland township, real, \$1,239.27; personal, \$328.11.
 Ayersville school district, real, \$268.12; personal, \$150.18.
 Noble township, real, \$1,146.79; personal, \$390.31.
 Mark township, real, \$2,511.49; personal, \$470.91.
 Mark school district, real, \$121.46; personal, \$9.73.

And what is said of this county in this connection will apply to many, perhaps all, counties in the state.

With many people the idea has become firmly established that the first payment in the year, of taxes, is made in June, and that is just where the mischief comes in. They are under the erroneous impression *that real estate taxes need only be paid once a year*, and so they pay in December. The first payment of taxes for any year

is due and payable between the first day of October of that year and the twenty-fifth of January of the following year. If the real estate tax (*first half*) is paid then, there is no penalty attached. If you fail to pay it, then 15 per cent. penalty will be charged. This matter is not discretionary with the auditor or treasurer; it is mandatory—it must be done—and whenever you, after having failed to pay the December tax, call at the treasurer's office in June or July of the following year to pay the taxes, he may not tell you that you are paying 15 per cent. penalty on the delinquent first payment, and your tax receipt may not disclose it, *but you are paying it just the same.*

The second payment of taxes for any year is due from about April 15th to July 20th of the following year. If you fail to pay the June taxes, you will be charged 15 per cent. penalty without failure on such June delinquency. Personal tax for the full year can be paid at the end of the year, together with the June real estate payment, without penalty. If you fail to pay them then, you will be charged up with 10 per cent. penalty.

The rules for paying taxes, briefly laid down, are as follows:

Real estate taxes must be paid every six months, unless paid in December for the full current year, otherwise 15 per cent. will be charged against the delinquent first or second half.

Personal taxes on property assessed in the spring of any year can be paid in December of that year or in June of the following year, without penalty. If not paid before the June collection of the following year comes to a close, 10 per cent. penalty will be charged.

If you desire to pay but once a year, go to the treasurer's office in December and tell him that you wish to pay the full tax—real and personal—for that year. Do not say "All taxes now due," because the taxes for the last half of the year are not then due and will not be due until the following June. If you follow this rule you will never be called upon to pay a cent in penalties.

Just one word more concerning ditch taxes and I will close. We frequently find petitions presented for the widening and deepening of Ditch No. so-and-so. This means that a regularly and properly established ditch has in time become filled up to such an extent that it is inadequate to carry off the water. Some land owner at once gets up a petition to the county commissioners, sets about to obtain the necessary signatures, files the petition with the auditor, gives the bond required to pay the expenses incurred in case the petition be rejected; then, if the prayer of the petition is granted, the auditor gets out the notices to all parties interested, fixing the time for the hearing at the head of the ditch. The surveyor next apporions the work, sells it, and then, after the ditch is completed, the surveyor views the job. If it be in accordance with the plans and specifications, it is accepted. *Why all this red tape? Why all this bother and expense?* How much easier, better and cheaper it would be, where an established ditch only requires cleaning out, for you, who are interested, to hold a meeting among yourselves and to agree on the best and quickest way to restore the water way to its former standard of usefulness, and to agree on the amount of labor to be performed by each person interested according to the amount of benefit derived? Try this, some of you, and learn whether it will not be of great pecuniary advantage to you.

With this bit of advice I close. If what I have said will be of lasting benefit to but one single person, I shall be amply repaid for the time devoted to the preparation of this paper.

SOME THINGS FOR WHICH THE FARMER SHOULD BE THANKFUL.

By SUPERINTENDENT U. S. BRANDT.

[Read at the Farmers' Institute held at Canal Winchester, Franklin County, Jan. 6 and 7, 1897.]

"What has the farmer to be thankful for?" These are the words that I overheard one Saturday afternoon, not many weeks ago, as I was strolling along one of the streets in our own village. The man who asked the question was, I observed, himself a farmer, a man in good circumstances, respected by his neighbors for his integrity and for his usefulness as a citizen. The subject of the conversation was evidently the observance of Thanksgiving Day—which season was then near at hand.

"What has the farmer to be thankful for?" It was a question that set me thinking; and, though, my reflections are but commonplace, and have doubtless occurred to you many times, yet still the question itself is an appropriate subject for this occasion.

The question referred to is but an illustration of a common characteristic of human nature. Dissatisfaction with his own condition is one of the dominant traits of man's character. This is not, in itself, an evil. It leads to a desire for improvement—to a restlessness which breaks the fetters that would keep man from rising, and lifts him to higher and better conditions. It has been called the mainspring of human action; without it there could be no advancement.

But this spirit of discontent should not be permitted to take complete possession of us. Instead of continually looking upward to where we hope to be, we should occasionally take time to glance downward at the depths from which we have risen, and to extend our sympathies to those who may still be struggling there. No one can ever do this without finding something for which to be thankful; and had our friend who asked the question done this, he would have found its answer in the manifold blessings that were his.

Let no one understand us to argue that the farmer's life is free from trials and hardships—that it is only a triumphal journey over a pathway of flowers. We know that this is not the case, for our own experience has told us so. But we would, this evening, dwell especially upon the bright side of the picture, and remind the farmer that nature has created him the richest man in the world. In the first place, the farmer should be thankful for his surroundings—for the beautiful things that he can always see about him. True, perhaps not every man would consider them beautiful; a great deal will depend upon his tastes—upon his capacity for enjoying the beauties that he sees. Where one sees something beautiful, another may see something unattractive or even repulsive. The humble flower growing by the wayside may seem to one only an ugly worthless weed; but to another it is beautiful, because he understands its laws of development and growth. One sees a rock half buried in the soil; he despises it, for it lies in the way of his plow; another sees the same object; to him it is attractive, because it speaks to him of other lands and other times—of its far-off home from which it was carried centuries ago. Thus he who is seeking the beautiful will find it wherever he may look.

The things which the artist vainly strives to paint upon his canvas, which the sculptor chooses for the subject of his labors, and about which the poet most loves to sing—with these the farmer comes into daily contact, and, if he approaches them in the proper spirit, loves them and becomes a part of them, he is the own child of nature. It is he who should best understand her lessons, her laws and her language. It need not surprise us then, when in literature we find him among her most faithful interpreters. We need mention here only one name—the name of Robert Burns, Scotland's peasant poet, who, while he toiled behind the plow, sang

the virtues of the poor and the beauties of the fields and flowers, in words which, for quaintness, simplicity, tenderness and natural beauty, to-day stand alone in our language.

Times will, indeed, come to the farmer, as they will come to every one, when his life seems to him the hardest, loneliest and dreariest that ever fell to the lot of mortal man. But in such hours as these may he not find consolation in the beauties that surround him? May not his cares be dispelled by kind nature, who "glides into his darker musings" and "steals away their sadness?" Listen now to the poet, who seems to be speaking especially to you:

* * * * *

"In spite of all
Some shape of beauty moves away the pall
From our dark spirits. Such the sun, the moon,
Trees old and young, sprouting a shady boon
For simple sheep; and such are daffodils
With the green world they live in; and clear rills
That for themselves a cooling covert make
'Gainst the hot season; the midforest brake
Rich with a sprinkling of fair musk rose blooms.

* * * * *

An endless fountain of immortal drink
Pouring unto us from heaven's brink."

"This," you may say, "is all well enough, but how will it help us in our every day farm life? It is not practical." In the ordinary sense of that term, perhaps not. If, when you say these suggestions are not practical, you mean that they will yield you no immediate return in dollars and cents, then, perhaps, you are right. But if you mean that they will not make your work more pleasant; that they will not bring cheer and gladness to your homes; that they will not lead you into broader fields of usefulness and into better lives—if you mean this, then you are wrong; and after all, what considerations are more important than these?

In the next place, the farmer should be proud and thankful that, from a moral standpoint, he belongs to the best class of people in the world. Statistics of crime show that, in proportion to numbers, fewer criminals come from our farming population than from any other of the industrial classes. Nor is this difficult to explain. It can be attributed only to the farmer's healthful—morally healthful—surroundings. He has for "his best companions innocence and health." Day after day he reads lessons of goodness and truth in the great book of nature, wherein the Father has revealed himself as surely and as truly as he has done in the book of Revelation. He comes into daily contact with what is beautiful; this can but tend to foster the growth of a character that is beautiful and, therefore, good. Indeed the beautiful and the good are so very closely related that they may almost be said to be one and the same. The Greeks—the beauty-loving, nature-worshipping Greeks—were so strongly impressed with this idea that they had in their language a well worn, almost inseparable phrase meaning the beautiful and the good. With them this was the highest ideal of human aspiration; and from their time until the present, this ideal has remained practically unchanged. Says Whittier:

"The good is always beautiful, the beautiful is good."

In the words of Akenside:

"Truth and good are one,
And beauty dwells in them, and they in her
With like participation."

And in the language of Keats:

"Beauty is truth, truth beauty—that is all
Ye know on earth and all ye need to know."

Find the man who loves the beautiful even for its own sake, and, though he be the veriest pagan, you will find a man who is not hopelessly evil. But find a man who loves the beautiful, not only for itself, but for what it represents—who loves birds and trees and flowers, not merely because they are beautiful, but because they speak to him of the wisdom and the beauty and the perfection of their Creator—find such a man, and you will find a man of pure motives and high ideals.

What wonder then that the farm has always been regarded as the source, the fountain head of all that is good in citizenship; that from the farm must come—if it come at all—the healthy blood that is to cleanse, nourish and invigorate a corrupt body politic; that upon the farm depends our very existence as a nation. In the world's history, nations have risen, flourished and fallen: Egyptian, Mede, Persian, Greek, Roman—all have been, but are now no more. The periods of their history may be written in a few short phrases; humbleness and growth, virtue and health, luxury and decay, corruption and death. Ask them the lesson of their lives, from the sepulcher of nations comes the answer, "If ye would live, cling to the simple virtues of your fathers!" Ah, my friends, what a responsibility here rests upon the farmer!—a responsibility for which he should be thankful. The farm is the nursery of those virtues and the farmer is their guardian. Fortunate and happy is the nation that possesses a hardy, happy agricultural people, and realizes what a priceless treasure it has in them.

"Princes and lords may flourish and may fade;
A breath may make them, as a breath has made.
But a bold peasantry, their country's pride,
When once destroyed can never be supplied."

The quotation just given suggests another reason why the farmer should be thankful. He should be thankful that, while he has all the advantages of the peasant who lived in the days of Goldsmith, he is not to-day a peasant, and has few of the peasant's disadvantages. It is a well known economic fact that the first requisite for the improvement of the laboring man's condition is intelligence, education, knowledge of his own industrial possibilities. We can readily see that this must be true. In order that a man may be sure of *doing* what is best for himself, he must *know* what is best for himself. Before labor can get her share of the products of industry she must know what that share is; before she can secure just returns for her services in the markets of the world she must know what these services are worth. And is it not true, that every year and every day, the farmers are more nearly approaching this condition?

While thinking over this subject a few days ago, there came to my mind a picture. I imagined that I was standing upon a height overlooking a farming community. I saw the farm houses—cottages, the merest hovels—whose one room was the dwelling place of a family. I saw the laborers—men, women and children—toiling in the fields, trying with the rudest of implements, to wrest from the stubborn earth their daily bread. In the distance, upon a rocky promontory, surrounded by wall, protected by moat and draw-bridge, I beheld a castle. There dwells the lord and master of the community. Without his consent these people cannot change their dwelling places—they are bound to the soil; at his beck and nod they hasten to do his bidding; for his support they are taxed. In all their relations with him his word is law, his power final and absolute.

And then I saw another picture. I saw, spread out before me, a beautiful landscape; I saw fields of golden grain, shady roadways, and white farm houses nestling among green orchards. I saw, not the misery and wretchedness that I had seen before, but prosperity and happiness; not the rude implements of barbarism, but the wonderful labor saving gifts of science. Instead of ignorance and degradation, there appears the handiwork of intelligence; instead of the castle, I see the schoolhouse and the church; and in place of servile obedience to an over-lord, I behold devotion to a government whose watchword is liberty and whose foundation principle is the equality of men.

I will let you, my friends, ask yourselves which of these pictures more nearly portrays your own conditions; and, having answered that, to ask yourselves whether you have nothing for which you should be thankful.

These questions are answered by this meeting itself. This gathering means education and organization. Nothing that has these ends in view can the farmer afford to neglect. The age in which we live is remarkable in many ways, but perhaps in no way more remarkable than in the wonderful growth and concentration of wealth. This, properly regulated and controlled, may mean life and growth for our country; but unregulated and wholly unrestricted, it may point the way to her decline and death. The only safety for labor lies in its organization; and it is here that the farmer has a mission to perform. Labor organized and united, directed by intelligence, guided, as it generally is, by worthy motives, demanding what it knows to be justly its own and granting no concessions that would compromise its own dignity to this power, irresistible as it will become, we must look for at least a temporary solution of the gravest problem that now confronts our country. In the solution of this, as well as all other national problems, the farmer must perform an all important part. His prosperity is the nation's prosperity; his destruction would mean the nation's destruction; his destiny is our country's destiny.

In expressing our hopes for the future of America and of America's farmers, we can do no better than recall the sentiment of Burns when he spoke to his beloved Scotland:

"O Scotia! my dear, my native soil!
 For whom my warmest wish to Heaven is sent!
 Long may thy hardy sons of rustic toil
 Be blest with health and peace and sweet content!
 And, oh, may heaven their simple lives prevent
 From luxury's contagion, weak and vile!
 Then, howe'er crowns and coronets be rent,
 A virtuous populace may rise the while,
 And stand, a wall of fire around their much-loved isle!"

LIVING WITHIN YOUR MEANS.

By MRS. E. D. MANVILLE.

[Read at the Farmers' Institute held at Delaware, Delaware county, December 14 and 15, 1896.]

This is a very appropriate subject for discussion, in these times of business depression. Many people are compelled to retrench. And as I have had much experience in trying to make a little money go as far as possible, I will speak of nothing which I do not know and practice. Of course the subject will be discussed from a woman's point of view. To look at all sides of the question would take too long.

In the first place, in order to live within your means, you must know what your income is. And this brings us to a principle, upon which all do not agree.

How can a wife be expected to spend money judiciously, when she knows nothing about her husband's business? I know that many people think that a woman is incapable of understanding financial matters. This idea dies hard. It is true that there are many women who know no more about spending money judiciously than children; but are there no men who are equally incapable? We have plenty of examples around us of women who have shown great shrewdness in transacting business; and you can all think of instances where the wife is the better business manager of the two.

So I say, as a first step toward living within your means, let husband and wife be business partners, and consult together about expenditures. How is it possible to have a clear idea of your affairs, unless you keep some sort of accounts? You will need no elaborate system of bookkeeping to keep a simple record of receipts and expenditures. A reference to your account book will often enable you to detect some small leak, which would, otherwise, be unnoticed.

Many farmers spend a great deal of money and sacrifice comforts, in order to give their children a business education. This is all right, but I think that a child's education in business habits should begin at an early age, by trusting him with small sums of money to be spent, and carefully accounted for. It will be better to learn to buy while under the parents' guidance and advice, than later on when larger sums of money are involved. Your accounts will be greatly simplified if you lay down the rule, and stick to it, "Pay cash for everything." You *can* "live within your means," if you *will*. Whatever your income is, spend less. You can all call to mind the advice given to David Copperfield by Micawber, who knew exactly how to keep out of debt, although, like many other philosophers, he preached better than he practiced. "My other piece of advice, Copperfield, you know—annual income twenty pounds, annual expenditure nineteen nought and six, result happiness. Annual income, twenty pounds, annual expenditure twenty pounds naught and six, result—*misery*." The blossom is blighted, the leaf withered, the god of day goes down upon the dreary scene, and in short, you are forever flooded."

The consciousness of being in debt is disheartening. It is like "the old man of the sea," in Sinbad's travels. Once let it clasp you around the neck, and you will find it next to impossible to shake it off. "Put the best foot foremost," but never do it at the cost of self respect. Poverty has no more galling sting than the fancied necessity for keeping up appearances. It is pitiful to see women, whose good sense in other matters is beyond question, wearing out brain and muscle in the struggle to imitate the appearance of richer acquaintances. It takes not a little courage to say, "I cannot afford it," but it is nobler and truer than to incur unwarrantable expense rather than confess poverty. One who is poor need not degenerate into careless, shiftless ways, for if ever thrift and good management are necessary it is when money is scarce.

Every want must be scrutinized and the test applied, "Can I do without it?" To many minds this careful, anxious thought is very repugnant. They call it stinginess, and point with scorn to any who advocate it. Better be called stingy than dishonest; and what is it but dishonesty to go in debt for things you could do without, and trust to luck to pay for them? In older countries economy is a most commendable virtue. There is a difference between economy and stinginess. An economical person exercises care and forethought in order to live within his means, while a stingy person denies himself the comforts of life in order to accumulate wealth.

In considering where retrenchment is possible discriminate between necessities and luxuries. Let economy begin at food and clothing rather than at books and other means of cultivating our higher natures. It is well known that we would

have healthier bodies and clearer brains if we ate simpler food.

It is a mistake to think that economy in dress means shabbiness. A small sum of money and a liberal expenditure of time and patience will keep even a meager wardrobe in good order and forstall the outlay of considerable money. When spending money for clothing or articles about the house, suitability as well as use and beauty should be considered. Much might be said on this point alone, but I will only take time to suggest it.

Of course, these thoughts are intended only for those who are in straightened circumstances. Happy is the woman whose means are so ample, that these vexing cares do not overtake her; but not less happy is she who cheerfully makes the best of adverse circumstances.

To her shall the words of Solomon be applied: "She looketh well to the ways of her household, and eateth not the bread of idleness. Her children arise up and call her blessed, her husband also, and he praiseth her."

THE FARMER AND THE COMMON SCHOOLS.

By HON. R. BAKER, Elyria, Ohio.

[Read at the Farmers' Institute, held at North Ridgeville, Lorain Co., Jan. 18, 19, 1897.]

The school system of Ohio is a credit to the state and not exceeded by any state in the Union. In the common or sub-district schools, youth in the state can secure an education without cost to their parents unless to share in the support of the schools by taxation.

My object in preparing this paper is to show that it is the farmer's duty to take an interest in the management of his district school. I know what I may say will be open to criticism, and I hope a thorough discussion will be the result, and fill up the thirty minutes allowed for it. If I am hit hard, I can bear it.

A large majority of the pupils in the common schools will, in after years, take a part in the agricultural industry. To these pupils belongs the future of this interesting and noble pursuit. It is of vast importance that these schools should be made as efficient as possible. Are farmers generally doing their duty in this matter? If the question is asked, "What can we do?" my answer is, commence at the election of your director, attend the meeting and see that a person is chosen for nomination who is sufficiently interested and strictly competent for the position. Do not favor a friend merely to get him into office. Have some guarantee that the person voted for will feel sufficiently interested to observe his oath of office in all matters pertaining to the business of the school board, and that he will be able to intelligently assist in the management of the township common schools, especially in the selection of teachers.

Too many directors seem not to care whether the schools are a success or not. It should be the object, as it is the duty, of all members of the school board to attend all the meetings and be prepared to give an intelligent statement of the condition of their schools, so that each member could enter into a discussion and ascertain whether the teachers were doing their work according to the rules of the board. Every member should have visited his school twice at least, during the two months since the last meeting. It is to be lamented that so few members of the board feel themselves responsible in this part of the work. Were they agents in any business or commercial firm, dare they neglect to visit the works and see if the workmen were doing their work properly? The duty of a member of the school board is as

strictly binding as in the case referred to. Every director in the board is responsible and should feel it his duty to see that every sub-district is in a prosperous condition. The teachers being hired by the board, every member should feel bound to work for the good of all; in fact, it is but one district.

Farmers ought to know and feel that it is the duty of all patrons to visit the school, and see for themselves what is going on. It is to be lamented that so few think it worth their while to see, or inquire into the workings of their school, and are satisfied with the reports of their children from time to time. Some of the children may be slow to learn, and think the teacher is too strict with them, and such are apt to say, "The teacher is hateful," and "I don't learn anything," and "I am going to be put back to a lower grade." And, too, many parents, without investigating the matter, think the teacher is altogether wrong. Were they to visit the school they might see for themselves. Many such parents will blame the director or board for hiring such a teacher, and probably the director or board selected the teacher, knowing that said teacher was competent to grade the school, so as to bring it to a higher standard of usefulness.

It is customary for some parents to visit the school on the last day of the term, thinking to see their children "show off" in the closing exercises of the term. There are many schools in this county that never see a visitor at any other time.

It is to every farmer's advantage to have these common schools conducted under modern principles, and all farmers are responsible, for they have the making of the school boards, and when said boards are deficient in their management, it is their duty to drop such members and put in better men or women.

Perhaps some may think I should not charge all the mismanagement to farmers, as mechanics are also voters. Of course where such voters exist they are equally responsible. I may be excused, as the districts in my town are composed largely of farmers, there being a large union school district, and that takes in all mechanics.

I am aware that our common schools are expensive, and as carried on in earlier years were very much neglected. That the old law of three directors who had the hiring of the teachers, had it been possible, (and they often made it so), would have pulled three ways. It might be compared to a three-cornered duel. When met to hire a teacher, each had a friend, and it was a second thought whether that friend was competent or not. In many instances two of these men would help each other. You vote for my choice this time, and I will vote for your's next term. You don't believe it was as bad as this under the old law? Well, I know it to be a fact, for I served twelve years under the old law, and know whereof I speak.

The Workman law was a God-send to our common schools. It has brought about a better management, especially when the townships have live and faithful boards of education, and if not repealed will probably be improved. An effort was made last session of the legislature to repeal it and it narrowly escaped the doom. It is safe for another year, as the General Assembly will not hold a session this winter.

There are many farmers who would to-day rather see the old law in operation, some for the reason that there would be three chances for office instead of one, others claiming that the old law was not so expensive and was good enough for them. Every intelligent farmer should be ready to petition the legislature, if ever the question comes up to repeal this Workman law—the best of the changes in the school laws of Ohio.

The Boxwell law is another improvement, giving the pupils an opportunity to prepare themselves in the common schools for the high schools of Ohio. Farmers generally care nothing for this law, when they should do all possible to encourage the pupil. The law is an encouragement and a stimulus for the ambitious students. They go to work with an energy to accomplish as much in their school as the town

pupil can do in the grammar school. Many will succeed under the eight-year course of study, and at the age of fourteen or fifteen years be ready to enter the high school, and if the board of education of their township approve, they have the power to meet the expenses of the high-school, making it free for the common school graduates.

The flag law is also worthy of the expense necessary in carrying it out. Farmers should encourage and support this law, and see that every township school board of Ohio has the flag displayed in every sub-district of the township. Every loyal citizen ought to feel it an honor to assist in raising a flag pole, and be ready to welcome "Old Glory" with a hearty salute. It is to be lamented that some farmers and patrons of schools, and even members of the school board, are quite indifferent, though authorized by a vote of the board, and pay no attention to the matter, although the law says, "The flag shall be raised." It would have been more effective if a penalty had been added when any director refused or neglected to obey the law. The national flag should be kept continually before the eyes of the rising generation. It will be well for the teachers to instill into the minds of their pupils the object the citizens of America had in establishing and upholding this emblem of liberty. When not spread to the breeze, it should be placed across the schoolroom, in front of the scholars, and the teacher should explain why they should honor and worship it, next to their God—the battles that have been fought under it to uphold the honor of America. It needs no text books.

The Workman law should have been mandatory instead of optional, with regard to the offices of superintendent and janitor. Had it been binding on all boards, much unpleasant bickering would have been prevented. Every man who is fit for a member of a school board will, at every opportunity, vote for superintendent and janitor. Our Elyria board the first year under the Workman law employed a janitor, and for two years omitted it. This year a majority voted against it, but just in the nick of time, the vote was rescinded and our schools have janitors.

Can farmers be satisfied to make the work of teachers drudgery? It is, or should be, demanded of teachers that they appear tidy in dress and ladylike. Can they, with sweeping and scrubbing to do? And is it proper or humane for a female teacher to go through mud and snow drifts and enter a cold room and shiver before she can start a fire? I ask farmers the question, is it right? Do you require our county officers in the court house to do janitor work? Oh, no, it would soil their fingers and boots, and would not be becoming to them to do manual labor. The teachers must do it or pay for it out of their salary. If they must do this, and teach all day, is it not more reasonable that the county officers should do janitor work? Farmers, see that you send a director to the board who will vote to enforce this part of the school law.

There is another matter which concerns the farmer in connection with the school. That is, a law should be enacted by the legislature to have the first principles of agriculture taught in the common schools. A majority of the pupils will probably devote their lives to the cultivation of the soil. Farmers should petition the legislature for such a law. In 1882, in my annual address as president of the State Board of Agriculture, I recommended that the convention request the legislature to pass a law requiring the rudiments of agriculture to be taught in the common schools of the state. It was talked up by members that day, and has been since, but not voted upon. There have been some articles in the papers on the subject. Some parties think it cannot be done without expensive books, etc., and then the teachers are not educated and qualified for the work. A smart, energetic teacher might take a few lessons from an intelligent and practical farmer, for the beginning—such as the effect of water lodging on and in the soil on the coming crop. In what way does underdraining affect and benefit the soil? Why do clover roots plowed under benefit the coming crop?

What fertilizer is needed for this and that soil for different crops? etc., etc. The teachers could be furnished with the bulletins of our experiment station and attend our institutes. I hope to see this study in the common schools in my time. It is as sure to come as the new school year. Farmers should attend to this, for a large number of youths will follow this industry and may not have any more education than they get from the common schools. Are there not many farmers in this institute and in Lorain county who regret that they are deficient in the education which is necessary (and will be more so in the future) to carry on a successful management of the soil? There are some farmers who have several sons. Should one want to follow the legal profession, or be a minister, and another a mechanic, the one left on the farm may toil day after day and month after month, getting a few weeks in the winter at the district school. For the sons who want to leave the farm the father will make sacrifices so that they may have a high school, or, it may be, a collegiate education; while the farmer boy is left in comparative ignorance. Is this right? The farmer boy needs and is entitled to as good an education as his brothers, though in a different line. Give the student in agriculture an opportunity to make himself a man—a man to be heard in our institutes, also in our legislature, and even in congress. It has been said that any fool can be a farmer. He may have the name, as many have, who are a disgrace to the industry.

To keep the brightest boys on the farm, the surroundings at the house and barns must be bright. Flowers and shrubs around the house, plenty of agricultural papers and magazines to entertain and improve the mind. Cheerfulness and love should reign all around. These attractions will do more to reconcile boys to the home and farm life, and to counteract the inducements for a city life, than any argument that may be advanced.

TEACHERS.

Farmers should elect such men or women directors as will advocate and do all possible to employ in the schools of every township a high grade of teachers—a man of principle who will respect his oath of office. It is best not to change a teacher too often, if she or he is doing good work. Let such teacher be engaged for the next year. There are many teachers and all should have a chance, but the best teachers should have the best chance. It is important that the teachers should not only be well educated, but sufficiently trained that the work may be done to the best advantage. There should be an aptness for the work. A teacher should have a way to draw the pupils to her, so that they can approach her with confidence. They should not only respect but love the teacher.

Farmers, as a rule, don't complain of their taxes for school purposes. All expenses should be cheerfully met to make the school efficient, though some farmers do complain. It has been said to me, "Your school board is extravagant and it makes our taxes too high." I have not noticed the Ridgeville tax. The Elyria township school tax last year was two mills and a fraction, only one township in the county lower. This year it is three mills, which is nearly the lowest in the county, and we have purchased the new county atlas for each school and five new flags, and provided for the expense of setting the poles. In Elyria township schools we have an eight years' course of studies, and uniform text books, and I believe about the same apparatus as in the Elyria grammar schools, and if our teachers are to educate to graduate under the Boxwell law, are we as farmers doing justice to our teachers unless they have equal apparatus to compete with the city grammar grades? Unless the township boards provide all that is necessary, all members opposing it should be ousted and better men selected. In short, it is best to have all necessary and modern apparatus and the many little details needed by teachers and pupils, and then let the directors see that the property is kept in proper order, well arranged on

tables and shelves. It is every farmer's duty to watch these matters, and if the surroundings and property are neglected, he should remonstrate with the director.

The surroundings should be as inviting as possible. A clean yard, with a neat walk from the road to the door. At the road end, scrapers, as it cannot be expected to have a clean school house unless the children have proper means to get the mud from their shoes. It is not very inviting for teachers and pupils to wade through mud up to the entrance. It seems almost useless to attempt to educate under such circumstances. The children should see neatness and thoroughness in all things connected with the school house and yard. All things should be inviting, not in slipshod condition. Such is not in keeping with a thorough education.

With the common schools only (where parties are not able to give further education) we have sufficient to give help to our boys and girls.

My brother farmers, let us see to it, one and all, that we make the best use of our common school system.

THE ADVANTAGES OF THE AMERICAN EDUCATIONAL SYSTEM TO THE FARMER.

By PROFESSOR P. O. ROBINSON.

[Read at the Farmers' Institute held at Plain City, Madison county, December 4 and 5, 1896.]

In this age of books, newspapers and public discussions, it is difficult to say anything new. A new idea is received by the world with almost as much rejoicing as the development of a hidden mine, or the discovery of an unknown land; but in discussing such old subjects as education and agriculture, the difficulty of presenting new material is increased many fold, for the subjects are as old as the historic world itself. In every country, the first people to emerge from the darkness of antiquity were farmers, and one of the first instincts implanted in their breasts was progress; this demanded education and ever since that time the most learned men of all ages have thoroughly discussed both subjects. Socrates and Plato, the Roman sages, the savants of the dark centuries and the learned doctors of modern times have not only approached them separately from every conceivable side, but have discussed them in their relation to each other; everything which can be said seems to have been said; originality in presenting old thought is well nigh impossible; and, indeed, in this paper it has not been attempted; it has merely been the endeavor of the writer in stating a few things which all of us feel to be true, but which many of us fail to put in tangible or definite form, to make up for the lack of profundity and originality by earnestness.

The subject has been divided into three main parts as follows: how our educational system is an advantage to the farmer on the farm, how it is an advantage to him as a citizen, and how these advantages may be increased.

Let us see how it aids the farmer on the farm. First, it enables him to take advantage of the elements. Who, for example, is more vitally affected by the winds than the farmer? Who, then, should be more familiar with the cause and action of the winds? Who is more interested in the change of seasons? Who, then, should be better acquainted with the cause of such change and the movements of the heavenly bodies. Who is so concerned about the chemical ingredients of the soil and of the products raised on it; about the properties of plants and their power of producing muscle or fat? Who, then, should be better informed in chemistry and botany?

Facts learned from the study of chemistry and kindred subjects are of more use to the man who farms than to any other man on the face of the earth; they are the laws of nature, with which he is in closer contact than those who are in other professions.

The scientific advance in agriculture during the last century proves this. By the aid of scientific investigation the fertility of the soil is not only regulated by the application of nitrogen, phosphoric acid and potash, but its productive capacity has been immensely increased. "The cost of producing milk and butter has been materially changed in the last twenty-five years by scientific methods; it is possible to so adjust the food of poultry as to increase the number of eggs laid in the winter months when prices are the highest." The comparative values of hay, oats, corn and wheat as food for animals has been determined with the utmost exactness and by scientific sanitary methods diseases among animals have been enormously decreased. It is education, under the name of science, that has done all this, and her work has but begun; touching as yet but the outskirts of agriculture, she stands before a great undiscovered realm, splendid with brilliant prospects, beckoning to the student with truths yet unknown, and methods yet unused. If education fosters ambition, then let the farmer educate his children; for in no other profession are there such bright hopes of that ambition being satisfied.

If all this seems vague and ideal make it real by asking yourselves if it would be of any advantage to you to know the chemical ingredients of each of your fields, to know the exact amount each product takes from the land and how it may best be replaced; to know, for example, how the different varieties of wheat affect the soil; to know the exact relation in price and food value of corn, wheat, oats and millet; to be thoroughly familiar with the germs of disease and the best method of their destruction. Would not this be of value? Then, since it is only through education, systematic and thorough, that these things may be known, educate the farmers' children that they may enjoy one of the greatest advantages of the American educational system.

The second advantage of this system to the farmer on the farm is found in the fact that it enables him to meet, upon an equal footing, the people with whom he comes in contact. The average American farmer is perhaps not much better educated than the average American artisan; yet he is not only clothed with much more dignity, but he holds a much more exalted position in society, why? Because he is a property owner, a landed proprietor. Caucasian peoples ever since the time they lived as barbarians, when they made war and drank blood from the skulls of their enemies, have regarded the owner of land with significant respect. That trait of our ancestors runs strongly in our veins; we look upon the farmers as not only forming a distinct class, but, as land owners, perhaps a little above other classes. The farmer handles larger sums of money at one time than the skilled laborer, who is perhaps his equal socially. He makes contracts and transacts business involving larger amounts than any other class of people with equal incomes. Since, in the variety of his business he is brought in contact with all classes of people, in order to meet them upon an equal footing, he must be educated. Although this may seem a trifling point, such is not the case as is proven by the history of the peasantry of England. Two hundred years ago the yeomanry of England, living upon small farms and owning them, formed the most independent as well as the most conservative part of the population. It was these yeomen who formed the bulwark of English liberty; it was before them that the mighty armies of Louis XIV went down in defeat. Now all this is changed; there are few small farms in England; the English yeoman has disappeared, and while his little farm now forms part of the great entailed estates of the English barons, he has been forced down into the ranks of day laborers on the farm or in the factory. Henry Adams, one of the most famous political economists of this country, declares that the greater cause of

this retrogression was the lack of education of the English farmer. While the American farmer, with his accute interest in educational affairs, scarcely has that to fear; yet he should realize that that very freedom from such a fear is one of the blessings of our school system; he should realize, too, that, if the coming generation of farmers—his boys—are not to be pushed down just as his English brothers have been in the last two centuries, the district school must be kept fully up to the times. The hard headed business man may sneer, but with equal brain power, equal health and equal opportunities, the educated man will come out ahead every time.

The next advantage to the farmer is that it makes the profession more honorable. Educate the farmer; make him the equal in that respect of the lawyer, the doctor, or any other professional man, and we will hear the last of the appalling migration of energetic, ambitious country boys to the city. There is no other reason in the world for the most ambitious youths choosing a professional life instead of a career on the farm, than that the educational standard of the former is higher than the latter. The average income of the farmer is equal, if not greater than the average income of the professional man; his importance to the community is even greater, so that there is no reason why his social and political position should not be as high. In fact, the American farmer has in himself everything to satisfy the most lofty ambition. Give the farmer an education in the higher branches; sprinkle more college men on the farms of the country and the agricultural profession would at once rise to such a dignity that we should no longer hear of bright boys going to the city to seek careers; it would be rather the ambitious city lad seeking his future in the country.

Now, before passing to the second division of my subject, let me recapitulate. The educational system of Ohio is of practical value to the farmer, because it enables him to use the laws of nature intelligently; because it enables him to meet on an equal basis the many classes of people with whom he comes in contact, and because it makes his profession the equal in honor and dignity to any in the world.

Now, let us consider the advantage which it is to the farmer as a citizen. First, it is of vital advantage to him politically. As our great cities grow in size, as the teeming population is crowded more and more into smaller space, it becomes easier for politicians to control a large number of votes. One man has controlled over one hundred thousand votes in New York City and Brooklyn; but did anyone ever control one hundred thousand farmers' votes, or ten thousand, or five thousand, or even five hundred? The truth is, that since they compose the most conservative and least corruptible class of citizens, the hope of a Republican form of government rests with the American farmer. If, then, his responsibility is so great, the educational system, in order that he may be able to fulfill his political duties as an intelligent citizen, is not only an advantage to him, but is a vital necessity. There is yet another way in which a good education assists to make the American farmer a better citizen. It enables him to live a broader and more complete life. It is the wish of the writer neither to encroach upon the pulpit, nor to make a trite sermon out of a dull essay; but there is more in this life than dollars and cents. The man who has enough to eat, is warmly clad and comfortably sheltered, is not necessarily getting the most out of life. We have boys under twenty-one years of age who have lived longer and more complete lives than many men of three score years. Russel Conwell's declaration that "he who thinks most lives most," is as true of the farmer as of any other class of people. It does mean something to appreciate art and literature; it does mean something to be in close touch with other professions; it does mean something to be a small yet potent factor in the influences that cause the world to advance. All this comes through education alone. If we were asked to pick from any community the most successful farmers, would we choose the most wealthy? Not necessarily. In fact, in most cases, they could not be taken even among the first.

We would choose those whose homes are built upon the broad principle that life is only complete when they and their families come in touch with all the best and brightest things of this world.

This brings us to the third division of the subject—how may these educational advantages be increased? First, let there be increased care and responsibility in the employment of teachers. The little red brick school house may be the corner stone of the Republic, but, in nine cases out of ten, the little woman who reigns supreme there shapes that corner stone according to her own sweet will. During school months the teacher is in much closer contact with the child than the parents. Then let the man who employs the teacher take into consideration that all holding teachers' certificates are not of equal value as teachers, even if their certificates bear the same grade and cover the same length of time; let him remember, too, that while the examiner's report is, to a certain extent, a certificate of moral character, it does not certify that the bearer has the power of developing moral character in others; that while it certifies that the bearer knows enough to teach, it does not say that he is able to impart that knowledge to others, and the latter is just as necessary a quality in a teacher as the former.

Secondly, let there be an increased use by farmers' children of high schools and academies. The older generation, no doubt, fails to rightly estimate the progress of the present. Many persons here to-night can remember that in their school days reading, writing and arithmetic were the sum total of what was taught in the school-room. Since, with those branches, they were as well educated as others around them, those were all that were required. That time has passed. To-day, he who has a college education is no higher, relatively, than he who, forty years ago, had a high school training; while the high school graduate now is no higher above his fellows than the one who, forty years ago, had a fair training in the district school. If you propose to confine your children to the district school, then you are not giving them as good an educational start as you received. High schools and academies are within the reach of all, and the farmer who spends one hundred dollars in sending his children to one of these is making a far better investment than five hundred dollars would be in tile ditches or hay barns.

The third means by which the advantages of our educational system to the farmer may be increased, is by the establishment of libraries in the district schools. Farmers, have your school houses libraries in them? The town schools have; and in them the children of the towns are not only coming in contact with the greatest men and women of all time, but are developing power of mind and traits of character that will place them far ahead of your children, if they are not given the same opportunities. If I were judge, and were compelled to decide which could best be spared, the teacher or the library, I should hesitate long before saying the library.

In this age of books, thirty dollars in the hands of an intelligent and experienced person will purchase a splendidly equipped library—one which will bring within the reach of your children realms in history, science and art of which they never before dreamed. Ten dollars for three successive years will do it, and the books will be of far more value to the schools than the charts and expensive apparatus with which you so liberally provide them.

These are the three ways I would humbly suggest as means toward the desired end—increased care in employing teachers, increased use of high schools and colleges, and the establishment of a library in each district school. Let the boys and girls from the farms have the same opportunities as other children have, and the American farms will continue to give to the nation its Jeffersons and Jacksons, its Websters and Clays, its Lincolns, its Grants, and its Garfields.

THE EDUCATION OF THE HANDS.

By KATIE E. DU MARESQ, Delta, O.

[Read at the Farmers' Institute held at Delta, Fulton county, January 8 and 9, 1897.]

The ancient Greeks made every other object secondary to the cultivation of physical beauty and perfection, while we in this generation are in danger of going to another extreme—the cultivation of the head only. Not less mental culture is to be desired, but a more perfect combination with the practical; a more thorough willingness to perform the duties which go hand in hand with the intellectual privileges. It is said that “figures don’t lie,” and while this proverb may not be applicable to all statements, as a rule we do respect painstaking calculations, though they do not convey to our minds pleasant truths when they show us how few children get a genuinely healthy, practical home training to supplement the intellectual training received at school; the former making the latter available to them and thereby elevating them to a higher plane of real usefulness and intelligence. Heads, hearts and hands seems to be the order in which these subjects of importance are placed and, of such absorbing interest are the first two, that the last seems to receive less and less attention. We have all with one accord come to consider the education of the hands quite unnecessary, if not rather beneath us; that, “the every day duties of life come natural to the girls,” and, “if the boys receive a good intellectual education they can do anything,” forgetful that they have only reached the “commencement” of anything as a specialty, when they graduate, and, far too many, have not even decided upon their future calling. It is also a fact that a large majority of the boys of our great middle class, by the time they have completed an expensive course, have exhausted their resources, and so have neither time nor means for the thorough mastery of the tedious and difficult technicalities of a successful profession; practically they have not even an errand boy’s or delivery man’s idea of the systems of business or trade, and neither the eye, the hand, the muscle nor, last but not least, the will for the farm. But if all other plans disappoint us, either temporarily or otherwise, the hands always come to our relief, and experience is one of the best and most thorough of teachers. What other members of our human organism respond so quickly, so willingly, and so usefully to training as the hands, and yet, with all their marvellous, latent powers, we do not give them even common attention in our educational plans? Is it not high time that they receive a more honorable place in our standard of culture? In former days the smallest children were taught to use their hands, but now we seem to forget that they need educating in any mechanical and industrial arts. A careful and indulgent mother says, “I would like to have my children handy and willing to be useful, for they are really worth so much more to themselves, but I do not know when they are to find the time to learn, except in the long vacation and they need those months for recreation. They lay aside their books and just rest and amuse themselves.” The rest and amusement are necessary, but recreation is far more restful if judiciously compounded with useful occupation. To the child, as to the adult after a time, even amusement becomes tiresome in the proportion in which it is sought as an object. Later in the conversation the same mother remarked that she was “always thankful when the school year began, for the children were so tired of doing nothing, so restless and mischievous that she hardly knew what to do with them.” That mother did not seem to think of giving those active hands something suitable to do and thus provide them with an object upon which to spend a part of their time and lavish their enthusiasm. Many of our young girls are actually unable to use a needle in the plainest kind of sewing until, perhaps, it becomes the fad to take lessons in the art of embroidery. Of how much greater value would those lessons be if a few hours

of each of those tiresome and mischievous days of vacation had been occupied with a little patchwork. But who thinks of giving a girl patchwork to day that the fingers may be early taught to hold the needle? Patchwork doesn't pay. But do not the lessons in sewing pay? and how greatly in later years are they missed! Mrs. Perkins, a lady of our own state, of bright, literary ability and a prominent member of both "Sorosis" and "The Guild," in a little talk on this subject, to a group of young girls, said: "The girl who can mend her own garments and darn her own stockings neatly is accomplished in one of the fine arts." There is no one who can educate and encourage these hands in channels of self help like the mother. She is an oracle of wisdom; in overcoming obstacles and improving on failures she is infallible. Carlyle says, "The king is the man who can," but the mother is the woman who can, and her sympathy and approval are nothing less than inspiration. They always incite the child to try again, to look farther and reach higher. After once they are begun there are no other lessons which contribute more quickly to their pleasure than these self helpful ones; and the pleasure is one of the smaller results when compared to the sense of strength and independence produced by the conscious ability to perform the necessary duties of every day life for themselves, in whatever situation they may be placed. In an article on home culture Mrs. Henry Ward Beecher says, "If it is really necessary that the early years of the daughters be given entirely to mental culture, uninterrupted by any domestic training, then we would urge most earnestly that, after graduating in our public institutions, it should be recognized as equally important to secure a thorough education under the tuition of a capable mother, though to us it has always seemed most desirable that the home education should begin at the earliest possible period and both be carried on together; for the years should not be allowed to pass unimproved when they are satisfied with small beginnings, encouraged with small successes and the inevitable failures caused by an untrained hand and an unpracticed eye be too severely criticised. Let their aspirations for knowledge be satisfied, if possible, but see that the training which shall make that knowledge of practical value, go hand in hand. The first ought ye to have done but not to have left the other undone." The tool box with the boys, as the needle with the girls, has fallen into disuse. Mechanical ingenuity and manipulation are succeeded by mental precocity. Life is presented as more ideal and less real, more theoretical and less practical. Then we wonder, when many of our college graduates disappoint us so signally in the battle of life; they are often the ones who return from their respective institutions loaded with honors, with high hopes and lofty ideals, and it seems as if there is nothing lacking but opportunity to prove them successes. The educated head, the enlightened heart, the working power and the zealous purpose are there; the mind works diligently and well and the heart seems to burn with helpful desire, but if they make any effort to realize their hopes or reach their ideals there are no results. Their education is intellectual only; the hands and will are not a part of the training, and there is a flaw in the connection between the working power and the sign of its accomplishment. Another, with no more mental culture, perhaps even less, but by practical knowledge more thoroughly equipped, will bring his forces to bear upon the solution of the great problems of life, and, by actual experiment, prove his theories wise and take his crown. It sometimes seems as though our practical, farm trained boys and girls are to be the only saving factors in our mechanical and industrial life, for they combine mental and mechanical knowledge as a working power. Are our farm trained boys to disappoint our hopes of them or are they to be an honor to our country? Where are they to stand in our national history? It is certainly desirable that our children learn to think. "Knowledge is power," says the wise man, and, with the educational privileges of our free school system, the parent is actually guilty who does not give his children a good intellectual education; but is it less desirable or honorable that they learn to do the work pertaining to

some calling, humble though it may be, with their own hands? Even though the beginning may be small, the man who can combine intellectual ability with practical skill cannot fail to be a power in whatever vocation he may choose, and according to Carlyle's theory must be a king, for he "is the man who can."

OUTDOOR EMPLOYMENT FOR WOMEN.

By MRS. ED. KLEVER, Bloomington, O.

[Read at the Farmers' Institute held at Bloomington, Fayette county, December 9 and 10, 1896.]

It is no disgrace for woman to work, but on the contrary, a manifest need since many of them have to earn their bread; aside from this the average American woman likes to earn her own spending money.

A good deal has been done in finding many different kinds of employment for woman, but the movement tends too much in one direction, that of indoor employment. And while numerous avenues of work have been opened to the industrious, capable woman, there are hundreds of women who must work, but who long to change their monotonous round of serving, teaching and housekeeping, and who weary of climbing other people's stairs. We want, then, some work for resolute, capable women of this description, and several avenues of employment might be found in the higher branches of gardening; in the culture of fruits, especially small fruits; poultry raising; and even farming and the rearing of thoroughbred stock, has been and can be made a success by women.

Beginning with the first named, gardening, and the culture of fruits, if we except the rougher kind of labor, there is scarcely a department which women could not carry out successfully; while for many operations, their quick intuition and their skillful fingers are pre-eminently suitable. The growth and tending of seeds and cuttings; the management of hot beds and plant houses; budding and grafting; the planting and tending of small fruits and training of vines is really woman's work; many have done it for recreation and health giving exercise, and there is no reason why others should not do it for profit.

To many active women, confinement indoors and continued household cares, with little or no variation, become almost unendurable. Even in this section of country, women might do much that is left to blundering men and shirking boys. All the fruit growing regions would profit by such employment.

Gardening, bee keeping, greenhouse culture and poultry raising are especially woman's work, and these are all reasonably, profitable occupations.

I spoke in the beginning of the culture of small fruits, and I know of nothing that would give quicker returns for the capital invested and labor expended, than the tending, gathering, and marketing of such fruits as currants, raspberries, and strawberries. These fruits can be raised on a comparatively small acreage and they come into bearing quickly. There is always in our larger towns and cities an active demand for small fruits. They are easily cultivated and any one who reads our best agricultural journals can easily learn the best means of culture. At our Institute last winter there was an excellent paper read on—"The Culture of Strawberries"—and any thorough going woman can follow out to the letter the instructive suggestions that paper contained.

Then following the fruits named, and bearing in a few years from planting, come grapes, cherries, pears, peaches, plums and quinces. While the smaller fruits were bearing and a cash value was being realized to encourage and bear necessary expenses, these, too, would be growing into money.

Many fathers could certainly set aside a very small portion of their large farms that a daughter might earn her own spending money. And why should not young girls be encouraged to learn the trade of planting and tending, of budding and grafting, of pruning and propagating? And why should not girls be established in business on the farm with as much expectation of its amounting to something worth while as is the case of their brothers? The exercise is beneficial, the work is not too severe and the results satisfactory. We see no reason why even the farmer's wife should not carry on such a business successfully. And when she has once tried it, and realized its profits, she may think it advisable to hire some of the house work done, and acquire health and strength in the outdoor work without injury to the home or its comforts.

And now we come to poultry raising. While almost every owner of a town lot can keep a few hens, it is the woman situated on the farm who secures the best results from the business. The clean farm range, the grass lots which surround almost every farm house are almost indispensable for the health and perfect plumage of fancy fowls. It requires no great amount of capital to purchase a pure bred pen of fowls and it is best to commence with but one breed and a limited number of that. With a small expenditure, suitable runs and well lighted, comfortable houses for the young chick and adult stock, can be built, while every fall a vigorous weeding out of all inferior birds will be required. Money will come in slowly at first. The business is full of work and discouragements. Many after a year or so of apparently unpaid labor will quit in disgust. Unless one is determined to persevere in the work it is better to have never commenced. The true fancier thinks enough of her birds to work for them, knowing that through the hottest summer suns, the coldest winter winds, they most need her care. An indolent woman will never succeed in this business. A society woman can make no success of it, because such work requires a vast amount of care and attention. But to the farmer's wife or daughter, who is determined to succeed, time and perseverance coupled with good judgment will bring its rewards in reasonably fair returns of cash.

To a true fancier there is no looking back, and the best of new blood to be introduced is none too good. Therefore we need not expect to buy for a dollar or two the best thoroughbred stock. First class birds come from no haphazard matings. Time, labor, money and judgment have been expended to produce these, and the breeder expects and will receive a fair price for such stock.

I mention the rearing of thoroughbred stock as being also a calling which women may follow. Many are already engaged in it, either from inclination or through force of circumstances. The raising of thoroughbred stock requires more capital than the pursuits I have before named, but that it can be carried on successfully by women few will deny.

You are no doubt familiar with the name of Virginia C. Meredith—the widow of General Meredith—who was left a large farm to manage in Indiana, stocked with Southdown sheep and shorthorn cattle, and she has managed it well. She exhibits her stock at many of the leading fairs and wins a share of the prizes. She occupied a position of importance at the World's Fair and in the commencement she was prominently mentioned by the press as one qualified to fill the office of superintendent of the live stock department. She is a fluent writer and that she is in love with her work and life on the farm her contributions to the *Breeders' Gazette* fully testify.

Mrs. Hallock, of our own state, raises Jersey cattle and her herds have contested for highest honors at our state fairs for several years.

I believe that women have pluck and patience and good judgment, with the will power to endure discouragements and disappointments, that in these respects they are the equal of any man.

To-day Mrs. A. M. Edwards is among the most noted of Nebraska live stock breeders—her judgment is relied on, and her name is honored.

Many women in the west own grain farms, ranches and orchards. These are oftentimes small, and their proprietors have earned them by hard work and much saving, but the investment should, "under good management" pay well.

In this work-a-day world when a great many of the women coming into it, must look forward to gaining their own livelihood, and often that of others, it is singular that it has taken all these years to realize the fact that women can do a great deal of outdoor work to advantage and profit, and frequently with great advantage to their health.

There is hardly a farmer's daughter in the land, who does not feel an interest in the work on her father's farm, and does not already know nearly as much about it as his sons do. Most farmers expect that at their death their sons and daughters shall share equally their possessions. Then if you expect your daughter to inherit a portion of your farm it will do her no harm, or you either, if you train her to do certain kinds of farm work. You can, at least, teach her how to get her sustenance out of the land, if necessary. If you cannot give to her the management of the fields, or superintendence of the herds, let the management of the hives be given over to her, and the sale of the honey; let her have the poultry yards, and erect for her suitable buildings; let her have a share of the orchards, the strawberry patches and the raspberry slopes. Any part of the farm which you may give to her, you will find she will manage as thriftily, make as much money, and receive as much respect as does her brother.

And in conclusion let me say, however sordid may be our views of nature, she will receive our advances graciously. There is not only money in outdoor employments for women, there is freshness of spirit, there is newness of purpose, and of those who engage in them truly it may be said, they find "Tongues in trees, books in the running brooks, sermons in stones and good in everything."

THE OUTLOOK FOR THE FARMER BOY.

By CYRUS ZIMMERMAN.

[Read at the Farmers' Institute held at Marysville, Union County, February 5 and 6, 1897.]

Very many farmer boys are wanting to get away from the farm, because there is a wide spread impression that farming is unprofitable and only a kind of menial service with plenty of hard work, few advantages and not much pleasure. They are told that the outlook for a young man is gloomy, no new lands to subdue, times have become more and more stringent as the years roll by, prices of all land products quite low, sales hard to make and, when made, quite often very unsatisfactory to both buyer and seller; many products below cost of production, no new markets opening for farm products beyond prospective supplies, with constantly increasing competition and more and more intensive agriculture. The farmer boy whose ambition is to operate one thousand acres of land as the pioneers did and after their mode of operation can see no bright future.

There is implanted within the breast of every active, healthy, energetic, intelligent farmer boy an ambition that at some time in the future he will have bettered his condition and have risen above his fellows. He often has an ambition to be a well dressed gentleman, respected by all who know him, so he flies to the towns and cities where he hopes to find more remunerative employment and, quite often, finds certain

disappointment. The cities are full of idle book keepers, would be clerks and helpers of every description; and, for every vacancy, twenty or more persons stand ready to take the place at prices that afford a bare living. The farmer boy, unqualified, can see at best only a very gloomy prospect, for vacancies along any line are less and less frequent as the years roll by. At present there are no fat jobs awaiting the unsophisticated country boy going to the towns.

The boys of America are all in the same boat; the future means for them closer application and business frugality heretofore unknown. The race of life is continually becoming harder; the causes at work, that have depressed agriculture, have also brought disappointment and distress every where else. In the battle of life the race is not necessarily to the swift nor is the battle always to the strong. We need in this country a different kind of teaching. Boys are told to set their mark high in life, then they may approximate their ambition. This kind of instruction frequently works very great harm, for many boys have set their mark so high that it is impossible to reach it, and they are finally forced to take their place with millions of other disappointed and discouraged men, as mere wrecks of what they might have been had they started with a better and more practical idea and adopted some line of life work suited to their talent and ability. Too many farmer boys aspire to become great men when they have no talent or inborn ability to rise above the mediocre. Only a very few men in any age ever rise above their fellows and those seem in a manner born to the place they fill. The great rank and file must be forgotten with their day and generation. Many a dullard has left the farm and is perusing Blackstone and quoting Daniel Webster "There is plenty of room at the top" when his ability will never carry him within hailing distance of success, while others are content to measure ribbons behind a counter, doing a girl's work for a girl's pay, when in truth their fine physical powers are sadly needed in the hay field or at the business end of a corn plow.

Labor ought not to be counted dishonorable; we must make it honorable. Hundreds of farmers' sons have been lured to the towns and cities because they did not wish to be classed as common laborers, and by the glare and flash of what seemed to them the successes of a few men in the cities whom they see. They fail to take into account hundreds of the same class who are not succeeding. Not more than five per cent. of all who embark in business prove successful, while ninety-five per cent. fail or only manage to make a decent living. It ought not to be considered as out of reason for a man to be a small farmer any more than to be a common merchant, or an ordinary business man or a professional man of indifferent talents. No country boy aspires to become a town loafer or store box artist, yet some become so eventually. I do not claim that the country boy should remain on the farm, regardless of his likes and adaptability, simply because he was born there any more than that a boy born near a drug store should become a druggist, but before leaving the farm, if his tastes incline him elsewhere, he should qualify himself well for the line of work he has chosen. The farms always have and always will send some fresh blood into the cities, but while some few rise to eminence the great rank and file of country boys cannot expect to go to the towns and rise above the mediocre. They often find themselves mere hewers of wood and drawers of water; then they may learn that the great advantages of the towns were unduly magnified, while those of the country were much underrated. I know of no opening to-day for any young man better and surer to bring ample reward for his labor than on the farm. There is as much opportunity to-day for a farmer boy of right make up as for any other boy in the world.

Close as times are, the careful, industrious boy can find employment on any farm in his neighborhood, and at good wages. Think of it, a young man of eighteen years getting fifteen dollars per month and board, amounting to one hundred and eighty dollars per year. Thirty dollars will keep him in clothes and pay his washing

and mending. At the end of ten years he can have, if he saves a similar amount each year, and keeps each year's earnings at interest, two thousand two hundred and fifty dollars. That amount will buy him a respectable farm as farms have been selling at recent sales; but he cannot do this and keep a horse and buggy and go around to every foolish thing going on; he must make up his mind to that. One of the serious troubles with many farmer boys is so many of them think they must own a horse and buggy and run around to every entertainment, spending valuable time and money for matters oftentimes worse than useless, learning bad habits, having no real purpose in view, wanting to sow their wild oats; and then want to get married to some nice, innocent girl, and they often do, and set up housekeeping with nothing but inexperience as their best stock in trade. The ambitious, healthy farmer boy, with a purpose in view, who prepares himself for life's duties can stand ready to take in the golden opportunities when they open for him. The boy who intends becoming a successful farmer must study and plan and prepare himself well with experience and funds before he attempts to embark on his own account. I know two young men, brothers, in my township who purchased a fine farm recently and paid cash for it out of their savings, earned as farm laborers during the last ten years. They are young enough yet to get married and make good husbands. After that kind of training no one need fear that they will let their wives starve or come to want, for that kind of boys seldom turn out that way. Twenty-six or twenty-seven years of age is young enough for a farmer boy to get married and settle on his own farm. At that age he will have become decided and his purpose for future life fixed, and he is only then getting properly fitted to fill his place well in the coming years. I know of another excellent young man near Plain City who saved his earnings from farm labor and spent four years at the Ohio State University, preparing himself as a farmer along modern scientific lines. He returned home in summer and went to work in earnest, and just a few weeks ago, through one of the university professors, a wealthy gentleman of Cleveland found this young man and at once employed him at a round sum of six hundred dollars per year and board for a series of years to superintend a dairy and hog farm near that city. There are plenty of just such openings everywhere for the right kind of farmer boy. Of such boys come our successful men. Our country district schools are sometimes called the farmers' schools; for many farmers' sons they furnish the only scholastic privilege. Not one moment is given to agricultural science, to botany, plant or animal life. Somewhere along the line, if not in the district, then in township high school, there should be instruction in relation to the tilling of the soil. Think of a medical school that taught no medicine, or a mining school that taught nothing concerning mine engineering! If agricultural sciences were taught in our district schools would it not have a tendency to beget in our young farmers a love for farm life heretofore unknown, and a marked elevation of the American farmer in the estimation of all the world?

We must not lose sight of the fact that the great majority of country boys are destined to remain on the farm, as the best place on earth to work out their life problem, if they follow the line of their adaptability; that the outlook for such boys who have energy and a noble purpose in view is comparatively bright when compared with the prospects of other boys in other callings, or compared with young men starting in farm life twenty-five years ago. At that time lands were much higher in price and all products as well as farm machinery were much dearer in price than to-day. A young man who began twenty-five years ago with an unpaid debt of purchase money on his farm has found in the passing years, with the constantly increasing depression and his inability to meet his obligations, that his debts have been practically made double their original amounts; but now it is generally believed the downward tendency has reached the lowest mark and must of necessity soon turn the other way.

In the near future, if we wish to insure the perpetuity of America and her free institutions, we must see to it that the American farmer boy remains on the American farm as the owner and operator of American lands.

As agriculture is the basis of all wealth, when agriculture suffers from any cause all other interests seem to be in sympathy and are depressed proportionately.

The decay and downfall of the Roman Empire is, by many, attributed to the unbusiness like and wasteful condition of her agriculture during a long series of wars with the surrounding nations or tribes, when every able bodied, practical Roman farmer was drafted from the farm for army service, while only serfs and bondsmen were left as tillers of the soil; and if the masters ever did return from army service they located in the cities. In consequence of such inexperienced and blundering methods Roman agriculture was agriculture in name only and Roman greatness vanished. Some one has said that each generation owes a debt to the preceeding one that can only be paid to the generation following. Compare the barren condition of Palestine with the prosperous condition of England of to-day where many fields under constant cropping for more than two hundred years have steadily increased in productive quality and soil fertility; so that many of these English fields produce from twenty to forty per cent. better crops than the same fields did two hundred years ago, the result of son following father and grandfather on the same lands during the passing years. The small farmer, with his farm paid for, can live at ease and comfort and be respected, can nicely educate his children, be a man among men, doing so with less worry or business anxiety and greater certainty of a good living than comes to the lot of any one else on earth; they why should any farmer boy be discouraged concerning the outlook?

CHARACTER BUILDING.

By MRS. LIDA MEREDITH, Marengo, O.

[Read at the Farmers' Institute held at Marengo, Morrow County, February 19 and 20, 1897.]

I do not write merely for my own amusement or for your entertainment. I write to urge a more serious consideration of our duty in what seems to me to be of greater importance than all else beneath the sun.

Let us not consider character and reputation as having the same meaning. Character is what we are, reputation is what we seem. A person may be all he seems and then his reputation is the reflex of his character, and it is equally true that this may be wholly different. Reputation is the shadow, character is the substance. If the character is carefully built there is little danger that the reputation will be bad, but a reputation may be destroyed and the character remain good. Character building begins in childhood. Every deed, whether well or ill done, every thought, whether pure or impure, enters into the character. If there be a weak place, a poor stone in the foundation, under great pressure the foundation may give way. Character is something that cannot be built in a month or a year; day by day, hour by hour, we fashion it, slowly, almost unconsciously, to the end of life. The so called "little things" enter into its make up to a great extent. Indeed there are no "little things," since they are noiselessly building a fabric that shall endure throughout eternity.

A question of importance, overshadowing all others, faces us to-day; what is to be the character of our citizens in the new century we are so soon to enter? However great our interests in politics, in tariff, silver or labor, we realize that there is

a still greater question, one which indeed is the end of all politics and government—the child.

Building character is the great work of our public schools. We want to place in this broad domain, people who shall know their rights, and knowing, shall dare maintain them. The putting into the generations that shall follow us, the character that can be trusted anywhere, is the object to be aimed at. We want our boys to be truly equipped for life's battle, helmet fastened and sword in hand. We must fight the great battles of the world through the children. The secret which decides the fate of any battle is found in the preparation. This is equally true of battles for reform.

The eye of this generation should be fixed upon the young. There is an army marching forward in which every man may be a hero—made strong in mighty conflict. Put your ear to the ground and you may hear them "Tramp, tramp, tramp, the boys are marching." Whether they march to victory over self, to victory over foes without, as well as foes within, will depend upon the habits they form during childhood and youth.

Within recent years an insidious vice has sprung up all over our land, and our brightest boys are falling victims to its power. This vice is the narcotic habit in all its forms, and especially in its worst form, the use of the deadly cigarette; it has grown to such mighty proportions that state legislators have listened to the appeal of the brave "white ribbon" women and enacted laws, while school boards are doing all in their power to enforce them. Parents, will you do your part; will you aid us in the educational work; will you aid us in the enforcement of laws? You can secure the evidence needed for conviction if you try. I ask you to look into the faces of those of our boys who have formed this habit and see how their better nature is being crushed out, and know that none are safe so long as our laws are violated with impunity.

Your boy may be tempted and may fall, as other good boys have fallen. Place the barrier of enforced law about him. The man who would wrong your son by selling him this poisonous drug deserves greater punishment than he who robs you of your property, yet you are raising no voice, lifting no hand in protest. Why? Partly because you do not see the dangerous nature of the deadly cigarette. A committee of United State senators appointed to investigate the nature of cigarettes, when legislation against their sale was pending, brought in a report that they are all injurious to youth, and congress passed the law that was petitioned for. A petition for this law was signed by teachers and ministers of the District of Columbia, and by two hundred and fifty-seven physicians. Professor Haithgun, of West Virginia University says: "The use of the cigarette has a tendency to foster in the young, inclinations destructive to high moral principles," and the testimony of teachers and Sunday School workers everywhere confirms his statement. Professor Maidis says: "Fifteen boys fell out of the tenth grade in one year from the use of tobacco." He now has an anti-tobacco league in every room, with excellent results.

The professor of the Adâ, Ohio, schools, where so many hundreds of young people are fitting themselves for teachers, says: "Several boys from here died last year from the use of cigarettes." Two boys were sent to an insane asylum from Hiram College from their use, in one year. A great many, if not all, of our large cities are pushing vigorous campaigns against the habit.

Four girls are now graduating from our high schools to one boy, and women are capturing places of honor and profit, because their brains are free from nicotine poison. Unless there is great improvement in the personal habits of our young men in the near future, young women going forth from our schools and colleges will capture all of the government positions. Young women, be strong, fit yourselves for the highest. In the meantime use every power you possess, to save our

boys from every vice that is degrading to them. Frowning upon these bad habits will arrest the thought of young men when all else fails. Demand in them as high a standard of morality as they demand of you; be kind, but firm. The more we study the problems of the age, the more is the conviction forced upon us, that the hope of the world lies not so much in *re*-formation as in *right* formation, that we must begin at the outset of life to cultivate the man in the nursery, as the gardener cultivates his plants in the hot house.

In no other calling in life are the finite and the infinite so closely allied as in mother work. Indeed, the mother who conscientiously endeavors to fulfill her mission, is nothing less than a co-worker with God. In view of these facts, we believe that if there be any difference, woman more than man, should receive the higher education. The children which we see all around us, growing up without self control, leading selfish or purposeless lives, lacking those elements of character which will make their lives useful and pleasing in the sight of God, attest the need of education in child culture on the part of parents, for how shall a mother, herself unprepared for intelligent work, cultivate the best there is in her children? It is like the blind leading the blind, and it is scarcely to be wondered at that one or both often fall.

It is becoming evident that more is gained by the thorough instruction of a class of little children, than by double the amount of effort by the orator who has the ear of thousands of hearers. The people go their several ways and continue as before, but lasting impressions are made on the minds of the children, as we all know who have labored with them. They often carry out and preach the temperance gospel, when mature persons could not get a hearing, much less a following, "A little child shall lead," as has been prophesied.

During the opening exercises of a convention in one of our larger towns, a young girl came forward and recited "The Little Feet a-Coming." Every heart thrilled, as sure enough, accompanying the closing lines, the rhythmic beat of little feet was heard, and, keeping perfect time, a hundred children simply uniformed in caps and sashes filed in; tramp, tramp, on they came, at a given signal, striking up a marching song; around and around the hall and up and down the aisles they marched, keeping perfect time to the music. That was all they did, just marched and sang and filed out again, the voices dying away in the distance. What was it that caused women's tears to fall like rain, while the applause rose and fell and rose again until it seemed they would never have done?

There followed an eloquent speech by a famous orator, but it took no such hold on the people as did the sight of that band of children. You say only sentiment? That is exactly what we must have. The appeal to reason alone will never bring about a great uprising. It is only when we touch the heart, that we move the masses, it is the only way the world has ever been moved.

Let us look at some of the problems that confront the mother, when her little ones, having heretofore only demanded attention to the physical needs, have grown to demand that larger care which is godlike, and a patience worthy of angels. There is the question of the home and the home life; how to make it so attractive that the home will be the inner center of the world's circumference, the place where the child most loves to be, so that the son or the daughter will feel the truth of the Spanish proverb "The smoke of my own home is better than the fire of any other." Then there is the question of the moral training of the child; how to teach it so it will learn from earliest childhood to hate evil and despise falsehood, and to love all that is pure and good; and then again we are confronted with the question of the mental guidance of the child. With what wondrous skill can a mother train the little one, so that it will delight in that kind of reading and study that will be useful in building up a strong man or woman intellectually. Greater than all is the question of her child's religious training. When the first-eager questions that be-

token an awakening soul and conscience are asked, then can the mother, gently, patiently, skillfully, guide her child's thought in the path of faith that begins at the cross and ends at the throne of God. May she be able to recognize the golden moments of the young life in which the precious soul may be sealed to Christ forever.

Then, that other and most important question that mothers so often miss, how to keep the confidence of their children; how to keep it so that the prattling child of four years, the girl of eight, the miss of fourteen and the young lady of eighteen are equally ready to pour into the ears of the mother the whole story of their hopes, ambitions, desires, griefs, disappointments and expectations; how to keep it so that the young man of sixteen to twenty-one, is as ready as the boy of five to lay his head in his mother's lap and tell her all that is in his heart. Oh, mothers! when you think of your children, and all the world may have in store for them, of either weal or woe, may you not almost echo the prayer of her who, bending over the forms of her twin babes and thinking of all that might be in store for them in the great future, said, "God grant that they may be either in Christ or in heaven while they are yet young."

Among all these questions the one I would urge mothers to give most heed to is this; how to keep the confidence of your children; for on this rests the foundation stone of their character building.

"That our sons may be as plants grown up in their youth, that our daughters may be as corner stones, polished after the similitude of a palace."

THE IMPROVEMENT AND EMBELLISHMENT OF THE HOME SURROUNDINGS.

By MRS. E. S. SHEPARDSON, Thornville, O.

[Read at the Farmers' Institute held at Thornville, Perry county, December 22 and 23, 1896.]

Nothing so attracts and charms the American traveler abroad, as the extreme beauty of the English rural scenery. The perfect cultivation of the land, the splendid roads, the neat, flowery hedges, the stone fences covered with roses, honeysuckles and other blooming vines, and especially the English country homes, with their velvety lawns, ivy clad houses and magnificent trees, all combine to form a picture of ideal loveliness that can never be forgotten. Painful indeed is the contrast between all this verdant beauty of the mother country and the miserable mud roads, the ungainly and dilapidated fences, the homely and unattractive dwellings set down in a treeless waste, which characterize too many of the rural districts of our own fair land. It is true that English country homes represent the growth and culture of centuries, aided by a genial climate, never very hot, and always moist enough to facilitate the growth of every green thing, while in America, a comparatively new country, the less favorable climate, and the hard conditions under which our forefathers labored while clearing away the forests, subduing the soil and bringing it under cultivation to supply the necessities of life, left little time and strength for what may have seemed to them to be the superfluous work of imbellishing the home surroundings. But the motive power back of this English culture, is to be found, I think, in that sterling quality of English character, the Englishman's deep rooted love of home. The home where his ancestors have lived, where he expects to spend his life, and where his children and children's children will live after him; the home around which cluster all the sweet and most hallowed associations of life,

and therefore, the place of all others to be made the most beautiful and attractive in all the wide, wide world. On the other hand, our restless American spirit, ever seeking change, always ready to pull up stakes and move on, always wanting to, or about to sell out or move away, is another element contributing to the bareness and unattractiveness of so many of our country districts. Perhaps much of this restlessness and desire for change may be due to the fact that we have made too little effort to render our country life alluring and satisfying.

But, now that we have passed beyond the pioneer period, and since, happily, there are in every community some who want to abide where they are, and are glad to live on where they were born and raised, has not the time come when we can and ought to give more time and attention to the improvement and adornment of our home surroundings?

Nature has done everything for us. Nowhere will we find more beautiful scenery than that which surrounds us right here in Licking county. We have a rare combination of the wild and picturesque, with the gently sloping hill side and the quiet valley with its silvery stream, and if we will do our share, to beautify the work of man's hands, this region may become fair as the garden of the Lord. It is true nature will not replant the grand forest trees, which we have wantonly cut down, but she will furnish a rich variety for us to transplant. She will not of herself cover up bare and homely buildings and fences, although she will do her best to help us if we will only give her a chance.

Constantly increasing attention is now being given to the location of the home in reference to drainage, its relation to the surrounding landscape, the best views to be obtained, and to the picturesque and artistic laying out of the grounds. Great care is given to architectural effects, the combining of comfort and convenience within, with lines of grace and beauty without, all very necessary and desirable, if one is going to build a new home. However, we will not stop to discuss any of these topics now, but simply confine ourselves to the question, how we may beautify what we have here and now, suggestions applicable, I think, to the cheapest and plainest homes, as well as to the more elaborate and expensive structures.

Of course, our motive in improving and beautifying the homestead should be, first and foremost, to make it more pleasant and attractive to the family, and every member of the household should have a share in it, thus strengthening the family bonds by a common interest and a delightful occupation. And this work of home improvement need not involve a great outlay of money. The simplest and humblest home may become transformed into a thing of beauty, by the united and well directed labors of the family, and, for the most part, with the materials nature herself has already at hand, all around us.

First of all then, after having decided how much shall be devoted to the decorative grounds about the house, let this portion be separated from the barns and out buildings by a neat wire fence, which will not only keep out the chickens and stock, but also serve as an excellent support for sweet peas, nasturtiums, flowering beans, hops, gourds, and other vines. This will form a good background for other decorations and make a beautiful screen, shutting out from view the homelier appurtenances of the barnyard. A smooth shaven lawn, and neat carriage drive and foot paths of themselves give an added air of dignity and elegance to a country place. The coal ashes and cinders from the winter fires, carefully spread in the spring, and supplemented by a few loads of gravel in the fall, will insure dry walks and drives, and will add immensely to the comfort and cleanliness of the home to say nothing of their happy effect on the temper of the good housewife. I admit that a good lawn requires considerable labor at first in the way of frequent mowing, renewed seed sowing, fertilizing, and occasional rolling, but after it is once well established, it can be kept in good condition by means of a light, well sharpened lawn mower that the children can manage, and I know of nothing that gives better

satisfaction, or adds more to the beauty of the place. But, after all, the crowning glory of the homestead must be grand and noble shade trees, and we are greatly favored in Ohio in having so many choice varieties of native trees to choose from, the red cedar, the chestnut, the elm, the beautiful maples and the flowering trees such as the wild cherry, the tulip, the dogwood, and many others that I might mention. One need not go far to take his pick of shapely and symmetrical trees, of great beauty and variety of foliage and tint, that will grow and flourish and cast their grateful shade upon the next generation, long after we have passed away and been forgotten. Much might also be said in praise of our native shrubs. What is prettier or more showy than the elder with its exquisite white blossoms in the spring, and its clusters of dark fruit in the fall, or the sumach with its gorgeous flaming leaves and plumes in the autumn, or the rarer rhododendron and laurel with their rich, glossy leaves and dainty blossoms? These massed in groups in corners, or on the sides of the lawn, would be very effective, and would make a fine contrast to the lighter colored flower beds, while the fragrant sweet briar and wild roses that grow in such profusion in field and meadow, would soon clothe the fences with grace and beauty. I am very glad that we are coming back to the dear old fashioned flowers that our mothers and grandmothers used to love so well, but which we have been too much inclined to look down upon as too plebeian and commonplace to suit our modern fastidious taste. We have come to see that, after all, expensive exotics are no better and perhaps not half so sweet as our old hundred-leaved roses, our lilacs and syringas, peonies, hollyhocks, and even the jolly sunflower, with its gay, good natured face nodding to us over the garden wall, as if to say "How d'ye do?" to every passer by. These are all very easily propagated, and are to be had for the asking anywhere. I know of nothing handsomer for a lawn than a mass of peonies, either of one or mixed colors, with their rich, dark foliage and brilliant flowers; and after they are done blooming, their low compact habit of growth, and fine color contrasted with the lighter tints of the grass, produce a very pleasing effect. I might go on to speak of the great variety of common bedding plants, phlox, verbenas, the gay petunia, lilies of the valley and mignonette, most of which perpetuate themselves from year to year, and ask only for a place to grow, and a chance to delight the eye, cheer the heart and beautify the home. And then, how a few vines will transform and glorify the plainest dwelling! Inexpensive triangular frames \triangle made of a few laths or thin strips of wood, and nailed up on doors and windows, will make cheap and pretty supports, and five cents' worth of morning glory seeds will send strong plants running rampant over porch and trellis, will change the house into a bower of beauty, shut out the glaring sunshine, and in turn furnish seeds enough to supply a whole neighborhood.

Or, if one prefers its aristocratic cousin, the moon vine, I know of no way by which an entire household can get so much cheap enjoyment, as by investing fifteen cents in one of these beautiful vines. Their rapid development, glossy leaves and subtle fragrance, furnish a dense and pleasing shade, while their interesting habit of growth, the marvelous expansion of the large, white, satiny flowers just at night-fall, and their peculiar attraction for the great bird like moth miller, make them delightful objects for study. By all means encourage the children to contribute their share towards the home decoration, by bringing from the rich treasure house of the woods, graceful and multiform ferns, and their favorite blossoms, the frail anemone and blood root, the many hued violet and the delicate and dainty oxalis. What exotic can surpass the lovely wake robin in its pretty green setting, or what hot house pitcher plant can rival our "Jack in the pulpit?" Let the children's birthdays and all the household anniversaries be signalized by the gift and setting out of a new tree or shrub or flower and let every member of the family have some share in the planting, if it be only to express one's individual taste as to selection or location; so shall you bind, more firmly and sweetly, each heart to the dear old

homestead. Thus far I have spoken only of that which may be procured at little or no expense, except the time and labor necessary to transplant. But, if one can afford to spend a moderate amount of money each year, say from three to five dollars, there is an infinite variety of evergreen and choice exotic trees to select from, which would furnish all needful shade and give charming contrasts and harmonies of form and color, while the many rare but hardy flowering shrubs and vines to be secured from our local florists will supply a constant succession of fragrant blossoms from May to November. A whole family may revel for years in the sweets of a dollar collection of hardy ever blooming roses, or of fragrant lilies and hyacinths. Time would fail me to speak of brilliant geranium beds, of masses of many colored coleuses and other charming effects, which taste and skill may produce at comparatively little cost. Do you say that to accomplish all this will require years of growth, and no end of hard work? So it will. But "Rome was not built in a day," nor was success in anything ever achieved without labor. But I know of nothing so wholesome or so restful for irritated nerves and fretted spirits, as work among plants and flowers, and I consider the adorning and beautifying of the home surroundings quite as necessary and important as the cultivation of the adjacent fields and meadows. Don't you? After all, if home is to be to us and to our children the dearest and sweetest spot on earth, can we expend too much care and labor in trying to make it so?

And what room for improvement there is in that other home, where our children spend five or six hours a day during the eight or ten most susceptible and important years of their lives! How bare and uninviting and uninspiring most of our district schools are! Set down at the corner of the cross roads, or in a great barren field, with neither tree nor shrub for shade or shelter, dusty in summer and muddy in winter, could they be more unattractive? True the neat brick house, with its modern appliances, is a vast improvement over the old frame with its discomforts and inconveniences, but so far very little has been done to embellish the external surroundings. And yet, with special care and attention on the part of school directors, the cooperation of teachers and pupils, and the combined efforts of the citizens of the district on Arbor days, these great centers of power and far reaching influence, might be transformed into objects of beauty whose stimulating example would in turn change the whole aspect of the surrounding country. Good, hard walks would add greatly to the comfort and tidyness of the school room; ample provision might be made for play grounds in the rear, while the front might be laid out in grass plots, with a few flower beds, to the care and culture of which the children would be glad to contribute; while walls draped with woodbine would conceal a multitude of angularities and defects and give an added charm to the whole. I think it would be an excellent thing for our school commissioners and county superintendents to offer premiums for the neatest and most attractive school buildings and grounds, just as some railroad corporations offer prizes for the most beautifully decorated grounds about railway stations. A little wholesome emulation and rivalry would afford a powerful stimulus to earnest endeavor in this direction.

Dr. Swing used to say, "He who plants a flower by his own door, plants one by his neighbor's door also," and it is quite surprising how contagious the spirit of improvement will become in a village or town. Let one citizen remove his front fence, get a lawn mower, set out a bright flower bed, and plant a fine clematis about his piazza, the increased beauty of the place is so manifest, that two or three of his neighbors will follow his example that year; the next season a dozen will follow suit, or do a little more; house painters will be rushed with work, and before one is scarcely aware of it, the whole town is transfigured, and its value as a charming and desirable place of residence greatly enhanced. During the past ten years, in many parts of our country, rapid and beneficial changes have resulted from the organization of village improvement societies, and I believe they would prove very advanta-

geous in every small hamlet, village and country district. They stimulate individual effort, stir up local pride and ambition and secure the cooperation of all the citizens in improvements of a general nature, such as good sidewalks, well kept roads, including the planting of trees along all public highways, keeping roadsides free from weeds and rubbish, embellishing the surroundings of schools, meeting-houses, and cemeteries, the establishing of public parks and so on. Nothing so improves the whole appearance of a village as the general removal of fences, and uniform, well kept lawns in front of the dwellings. It is, however, sometimes quite difficult to secure this pleasing result, and homely fences are left here and there which mar the beauty of the whole. The obstacles in the way of village improvement, for the most part, are such that public opinion, common sense and a careful regard for the rights of others ought to remove very speedily. One is, the reckless driving of cattle through our streets. A frantic cow chased by a more frantic man on horseback, galloping back and forth over a lawn and flower beds, will undo the work of months and inflict injuries that will require months to repair, if it can be done at all. This ought not to be tolerated in any community.

Another difficulty is, the tendency of careless people to make zigzag paths across lawns, and to wear off the corners by short cuts, thus marring the beauty of that which has often caused much labor, and greatly discouraging any farther attempts at improvement. A more careful observance of the ordinary rules of courtesy and propriety ought to obviate this trouble. But perhaps the greatest annoyance is from the industrious hen turned out to scratch by day, and the poor old horse and cow let loose to graze by night. Of these, the hen will take the premium for the amount and the quality of the mischief done. From the earliest dawn until it is time to go home to roost, her tireless feet never cease their activity so long as there is left in the neighborhood a single flower bed or tomato patch to devastate, and when she does, at length, at nightfall, turn her feet homewards, destruction and waste are in her pathway.

It is but a very few years since pigs were allowed to run loose in the streets of Granville. Horses, cows and calves might have been seen tethered anywhere along Broadway, grazing beside the sidewalks, while they pastured at their own sweet will on the back streets and in vacant lots. No one would think of approving such things now-a-days, nor would they be allowed in any well regulated village. No one will deny the right of any citizen to keep chickens, if he will keep them—in their proper bounds—on his own premises; nor will any one hesitate to deny his right to inflict annoyance and injury upon a whole neighborhood and community, simply that he and his family may have a few fresh eggs every day. If public opinion and regard for other people's rights and privileges fail to remedy these evils, then they should be suppressed by village ordinances just as other nuisances have been.

Every home has its own individual expression, just as every man, woman and child has, and the moment we look at a home we decide what its character is, whether it is the home of industry, economy and thrift, or of idleness, waste and shiftlessness. The approaches to the home also affect our estimate of its character. If we are passing along a good road, with fine shade trees, neat, trim fences and well cultivated fields, we at once and naturally expect to see a beautiful and prosperous homestead, and in nine cases out of ten our conjectures are correct. While on the other hand, dilapidated fences, old, abandoned houses with battered windows, gaping doorways, rickety sheds, and weeds galore, give a poverty-stricken air to the whole community, and have a very depressing effect upon the beholder. There is no better index of the thrift and prosperity of a country, than fine roads, lined on both sides with stately trees, nor is there anything that adds so much to the beauty of the landscape. How often we have enjoyed the refreshing shade of that row of magnificent maples, which some good man or men planted sixty or seventy years ago, just east of "Dugway," on the old Newark road! And how often on a hot sum-

mer day, we have wished that line of trees had been extended all the way from Newark to Granville! It might have been just as well as not, had there been concerted action and cooperation on the part of the farmers all along the way, or a general observance of Arbor Day from year to year. What a magnificent avenue it might have been. Just such a boulevard as our large cities are making at a yearly expense of thousands of dollars! It is not too late now, and there is no reason why we should not have one of the finest avenues in the world extending from Newark to Johnstown and far beyond. We have only to consider what enthusiasm and combined effort accomplished in one day for Sugar Loaf Park, last Arbor Day, to realize what might be done in other directions, if we earnestly and zealously set about it. As *is* often said the "bicycle has come to stay," and probably modifications of the bicycle, and electric carriages of every description will soon entirely displace most of our present light vehicles. This will necessitate the universal betterment of our roads, and undoubtedly the great work of the country in the next decade will be the radical change or rebuilding of all our highways after the most approved methods of road making. With these inevitable improvements, will come also, I hope, the universal planting of our finest varieties of native shade trees along our roads, and the embellishment of the road sides.

I rejoice in the advent of wire fences. Not barbed wire ones. They are barbarous, cruel alike to man and beast, and ought to be banished, every one of them, to Spain or some other barbaric nation. But I mean the latest and most approved smooth, galvanized wire fences, tightly stretched and well supported. They are sufficiently strong for all practical purposes, waste but little land, are inconspicuous, and will furnish a good support for vines and flowers that may be trained along them. They would readily lend themselves to decoration, and with our woodbines, wild clematis, wild cucumber, and some varieties of the fragrant honeysuckles, which like nothing better than to clamber over a fence, would soon be clothed with a curtain of luxuriant green, against which the golden rod and ironweed would flaunt their standards of royal purple and gold, and the modest wild rose, pure white marguerite, brown eyed daisy, and star like asters, would bloom in graceful beauty. One of our good housewives in Centerville gave us an object lesson last summer in just this direction, by showing us how a homely board fence may be glorified by massing against it quantities of our common flowering plants and vines, which, blooming in succession throughout the summer, pleased the eye and cheered the heart of every passer by. One of the suburbs of Chicago is especially noted for its great beauty, made attractive at first largely by the efforts of one lady and her son who have been accustomed to go out every year with packets of flower seeds which they have scattered along the wayside. One form of decoration led to another, until the entire suburb is a mass of bloom and beauty attracting visitors from far and near.

In England, there has been in active operation for a number of years, an organization of boys and girls, whose sole object and aim is to look after the roadsides, to keep them free from litter and rubbish, and to beautify them by sowing seeds and planting native flowers in every available spot, especially such varieties of flowers as seem to be dying out. The latest issue of the *Ladies' Home Journal* refers to a new movement just organized in Boston, New York, Philadelphia and Hartford, and taken up with enthusiasm by smaller cities, towns and villages. "It is the formation of the school children into a Juvenile Street-Cleaning Brigade. Every member is pledged to pick up stray pieces of paper which he may see, and deposit them in receptacles provided by the city at convenient points. Every member is also pledged not to throw bits of paper, fruit or refuse of any description whatever in the streets, nor injure, deface or mark fences, porches, or property of any sort." How practical this scheme appears, and what a vast difference it would make in the appearance of our rural districts and towns!

Could we institute some such movement here (and the marked success of the similar organization in England proves it to be perfectly feasible) we might include in the children's work, not only keeping the streets clean, but the planting of flowers and vines along the country roadsides, and the adorning and embellishing of the schoolhouses and grounds, thus developing in them habits of neatness and order, and cultivating the love of beauty, very desirable qualities in themselves; and we should also secure their invaluable aid and cooperation in making more beautiful and attractive our rural districts and our rural homes.

AFTER THE FEAST—THE LEFT OVERS.

By MRS. MARY W. TUCKER.

[Read at the Farmers' Institute held at Lucas, Richland County, December 4 and 5, 1896.]

When the committee on program asked me to write a paper for this occasion, it was suggested that I tell something about butter making. Nothing could be more absurd, for we all know that every woman in Richland county can make better butter than her neighbor.

We have already had a feast—a veritable full meal—of good things, so I will write of the "left overs," gathering up scraps of the savory food, which it were wicked to waste, and serving in some other form.

We have been nourished with healthy mental food, which has been served with a liberal hand. Not the service of a worldly lord to a menial, nor that of a slave to a master; but from our brothers, the tillers of the soil, they who work together shoulder to shoulder, to bring from earth's great storehouse the golden wheat and yellow corn for our bread; the meats, vegetables and fruits which fill our cellars, leaving still a surplus with which to feed the millions. The farmer and his family *first*, and the "left overs" to others.

Time was when farming was thought an ignoble calling, when the brightest sons were given educations and trained for business or the professions; when, if there was a dullard in the family, it was said, "He is only fit for a farmer." Ah, what changes time has wrought! To-day the successful farmer must be educated, not in the classics or dead languages necessarily, but in mathematics, which he will need every day. He should be a mechanic, a machinist and a chemist; should be a political and social economist, a reader and a thinker, and, over and above all, a gentleman and a Christian.

Our greatest statesmen, our most eloquent divines, and our most successful business men, have come from the farms. Is it any wonder Scott could write poems of such wonderful measure, telling tales of such pathos and power, when his life was spent among the lakes and heather of the highlands?

Is it any wonder an Angelo could paint such pictures when nature had furnished such perfect tints to his artist soul? The greatest artist's greatest work is but a copy after all.

It is the farmer, with his toil stained garments and hardened hands, who sees the pictures in their realistic beauty. A worthy pastor once truthfully said, "Ohio farms are more than Mexican thrones!" Then an Ohio farmer is more than a king.

What think ye of that, oh, farmers, who, often weary of the lonely toil, who wipe the sweat from sunburned brows, who see for yourselves and your children only the toil which was your fathers' before you and will be generations after you?

You who often envy ~~men~~ in high places, do you ever pause to think that no man, from the king in his palace to the laborer who works on the street, leads a happier life than you might and should live?

No man can breathe purer air, no man can drink sweeter water. Your home is your castle, whose moat and battlements are faith and peace. Your clansmen are tried and true, for they are your wife and children. A gallery of the most wonderful pictures is yours. You have but to look to behold the most gorgeous sunsets or marvelous sunrises, for nature is the artist, and nature is God's.

Who ever listened to sweeter songs than those which your bird friends sing to waken you on a summer morning? What prince ever laid down to rest at eventide with such perfect peace? What man of all the men on earth receives his bounties so directly from God? You are the middleman between his bounties and his creatures. The millionaires' bread was gathered from your fields, his meats were taken from your flocks, his fruits from your orchards and vineyards. Your wife, the queen of your home, your ever ready helper, lives only in the realm of which you are king. Your children are saved a thousand temptations, your mind a thousand worries.

For you the flowers bloom, for you the birds sing, for you the sun shines, for you the fullness of the feast. Honest toil sweetens rest and earnest effort brings its sure reward. 'Tis true that storms will come, and disappointments cast a dark shadow, but just as true they will pass away again. Uplift your calling. Look for the bright spots which are scattered so thickly all along your way, that the darkness seems but a passing shadow. Regard the farmer as one of earth's noblemen and thank God that you are one of them! Whistle instead of whine. Hold your head up like a man, act like a man, and that man a farmer. Keep the home bright with the sunshine of a joyful life. Buy good books, subscribe for clean papers and read them, use pure language, shun evil habits, and your home will be your kingdom where every son is a crown prince and every daughter a princess royal.

PROCEEDINGS OF THE STATE FARMERS' INSTITUTE,

Held in the Senate Chamber, Columbus, O., January 12 and 13, 1897.

MORNING SESSION.

TUESDAY, JANUARY 12, 1897.

Promptly at ten o'clock on Tuesday, January 12th, Secretary W. W. Miller, of the State Board of Agriculture, called the State Farmers' Institute to order, and said: Gentlemen, on behalf of the State Board of Agriculture I extend to you a most hearty welcome to the capital city of the state at this Institute session; and I congratulate you, and congratulate the State Board of Agriculture, under whose auspices this meeting is held, that we have so goodly an attendance so early in the day. It augurs well for the future meetings of this Institute. The State Board of Agriculture wants it definitely understood that this Central or State Farmers' Institute is *your* Institute. Everybody will be recognized by your worthy presiding officer, and it will be a pleasure to the Board if great good can result from this meeting, as is confidently hoped. The Institute will be in charge of the officer chosen by the State Institute one year ago, and it affords me peculiar pleasure to introduce the presiding officer of this meeting, Professor Wm. R. Lazenby, of the Ohio State University.

ADDRESS BY PRESIDENT W. R. LAZENBY.

Members of the State Farmers' Institute:

I bid you a cordial welcome to this annual meeting. The custom, which appears to be firmly established in this State, of meeting once a year in the capital city, is an equally pleasant and profitable one.

The fundamental object of our meeting is to elevate the character and advance the interests of the arts of agriculture and horticulture. But our meeting should mean more than this. For each one of us individually, the State Farmers' Institute should stand for good fellowship, good citizenship and good scholarship. It should be the model farmers' institute of the State. In renewing old, and forming new acquaintances, our social instincts are developed and gratified; in the free and full discussion of important economic questions we can scarcely fail to become

braver, better and more useful citizens ; and we cannot bring mind in contact with mind without evolving thought.

One of the greatest needs of the farmers of Ohio to-day is an intellectual awakening. We need to mingle more thought, more study with our work. We need a larger knowledge, a fuller command of science. It stands to reason that the more a man knows the more he can do. The more deeply and clearly he can think, the more economically and advantageously he can work. Some men think until the brain becomes feverish and overworked ; others labor with the hands until the body becomes bent and prematurely aged. This is all wrong. The thinker and the worker should be one. This is particularly true of those engaged in the arts of agriculture and horticulture. The wand of science has made farming and gardening intellectual pursuits. It has taught us that this is a world of law ; and that each event in nature is the logical sequence of the events which preceded it.

Chemistry, botany, geology, entomology and other sciences have done much for the farmer's and gardener's art. They will do more. We may not all agree that there is a science of agriculture, but we do all agree that there is an intimate and helpful relation between general science and the farmer's calling.

We are fully satisfied in regard to the signal value and importance of scientific research. It explains, simplifies and verifies the practical operations of the farm and garden. If scientific research is important, a knowledge of the results of such research is equally important. This is one of the objects of this State Institute. Scientific specialists will tell us something that we need to know. On the other hand, men who have mastered the arts of agriculture and horticulture will tell us what they have learned by practice and experience. Science and art, theory and practice will go hand in hand, and the joint work of these cannot fail to result in substantial progress.

Perhaps the assertion ought not to be made, but I cannot rid myself of the belief that the agriculture and horticulture of this country are very far below the standard which they should ere this have reached. In an age when every child may be fairly educated if he will, an age of institutes, societies, schools and colleges, there ought to be more matured fruit gathered from the tree of knowledge and science.

Members of the State Farmers' Institute : There are two things that we should constantly keep in mind. The first is the improvement of the agriculture and horticulture of the State ; and the second is the elevation intellectually, socially and morally of the whole agricultural community. This annual State Institute ought to stand for the best science, the best theory, the best thought and the best practice for the farm, the dairy, the garden, the orchard, the vineyard. It ought to be one of the strongest, grandest organizations in the State, a great center of light and influence.

I trust that each one present will do his part toward making it what it might and should become.

You will notice that the worthy Secretary of the State Board of Agriculture and his able Assistant, have prepared a feast of good things for the three days that most of you will be here. In addition to the papers that will be read and the discussion that is to follow each paper, a list of questions has been prepared which covers a wide range of interesting and suggestive topics. It is hoped that there will be ample opportunity to consider the most important and timely topics of this list.

But in order to do this we shall be obliged to resort to a pinching economy of our time. We must strenuously avoid all irrelevant talk, all straying into the forbidden paths of personalities, partisan politics or sectarian religions.

As presiding officer I shall be pleased to recognize any one, even the youngest and humblest, who can shed any light on the subject in hand, but I shall promptly call to order any one who does not confine himself strictly to the question

before us. This is the only way to dispatch business and secure equal privileges for all.

I congratulate the Institute upon the attendance at the opening session. I am also pleased with the evident earnestness and enthusiasm manifested. Coming together in this spirit we can scarcely fail of having an institute that shall be a signal and all-inspiring success.

The President: Now, gentlemen, I believe it is customary to appoint one or two committees, but as it is likely that the attendance will be somewhat larger this afternoon, if there is no objection, I shall defer the appointment of such committees until the afternoon session. Is there any other business that would naturally come before the Institute at this time?

If no one has any business we will enter upon the regular work of the program, and the first paper is an address upon the "Chinch Bug and Hessian Fly," by Professor F. M. Webster. This is a timely subject and I trust you will give particular attention to Professor Webster.

ADDRESS BY PROFESSOR F. M. WEBSTER.

Mr. President and Gentlemen: I do not particularly desire to talk. I have no paper to present, but there are certain of your interests that you have placed in my keeping, and I simply want to tell you what you wish to know regarding those interests. Further than that I do not wish to waste one single word.

Now, I cannot, of course, tell what each one of you may have in mind or upon what particular point you may wish light. That part I shall have to leave to you, and shall expect you to make your wants known. I will simply go over an outline and leave to you to fill in what may be, to you, missing links. Now, I assume that there is no farmer in Ohio but what is sufficiently familiar with the chinch bug, so that I need not go into a description of it. I know you have been saying for years that the pest would not become abundant or destructive in Ohio. In fact, I have been told again and again that you didn't raise that kind of a crop, but the last three years have shown that you *can* raise a crop, and about as successfully as is done farther west. I assume that you know about the subject upon which I am to speak to you, so I will not go into any detail about describing it, but rather give you the present status of affairs, and tell you, as best I can, how to ward off a possible danger. You may not all of you know that there is a brood of young developing in the southern part of the State in August, and this occurs a little later as we go northward toward Lake Erie. That brood, reaching the adult stage in the fall, and hibernating over winter, is the one that lays eggs in the spring, and produces the generation of young which is the most destructive to farm crops. The second or fall brood is is very seldom injurious.

Now, from what I can learn, this fall brood has gone into winter quarters in considerable numbers, numbers far above the ordinary, and that means that the possibility of trouble next year is rather a serious one. I use the word possibility and not probability. It would not make any difference whether there were one thousand of these bugs wintering over or one million, if we could control the weather next May, as we could settle the whole problem, but that we cannot do, and therein lies the uncertainty.

Those that are to produce next spring's brood, the ones that will give you the most trouble, if you have any trouble, are passing the winter, now, in rubbish along hedges, in the woods, under leaves, under matted grass, in corn shocks, and every-

where where they can hide away and get protection from the winter weather. And while they appear to seek for protection in this way, it is nevertheless true that we probably have no insect that will better withstand the winter, with less injury to itself, than this chinch bug. We can freeze them up solid in ice, thaw them out and as they get warm they are just as good as they were before; so that winter weather will have but very little if any effect upon them. Now, having told you where the trouble is, it will open up to you a way of reducing the possibility of an outbreak next spring, and that is this: Wherever you can burn this rubbish—and there are usually times in the winter between this and spring in which you can burn over the woods—you can burn off along the hedges; you can burn the grasss along your fences, in the fence corners, the roadsides; and if you time your burning so that the rubbish and grass will be burned off clean to the ground you will destroy myriads of these insects before they leave their winter quarters.

Now, that opens up to you one method by which you can fight chinch bugs, in the winter time, when you have time to spare and without any very great expense. These chinch bugs will stay in their winter quarters until the first warm days of spring. I should say, perhaps, speaking tentatively, about the time or soon after the peach comes into bloom; then they will spread from their winter quarters to the fields, more especially to your wheat fields. But you cannot fence them out. You cannot put up anything that will keep them away from your fields. You can apply nothing to your fields that will keep them from going there, except under certain conditions that I am sorry do not always obtain. Whenever they go from their hiding places to these fields they at once begin to lay eggs; the young hatch, little tiny red mites you might call them, then from that, casting their skin, they will assume a little duller red and then a slate color, and a little later on to the fully developed insect.

You are familiar with the way in which it attacks plants, but there is this characteristic that you could also take advantage of, it seems to me. The mother insect has no other way of caring for her future progeny than placing her eggs where there is a prospect of the greatest amount of food. She dies before all her eggs are hatched, usually, and they will seek out, as a rule, such places as offer the greatest amount of food for the young. They are grass insects. Consequently they will go the grasses that they most relish; but they have a greater desire for wheat than for the ordinary grasses that are grown. But there are grasses that seem to be more attractive to them than wheat. Most of you who have had to deal with them in the past year have noticed that in going from your wheatfields to your cornfields they will stop on the meadow fox-tail. I do not suppose that any of you raise that kind of grass in your corn; but if you do, you probably noticed they would start on the first row and instead of taking the corn they would take the grass, and so long as the grass held out they would give that their almost undivided attention. Millet has almost as much attractiveness for them, and it seems to me that, wherever you can interpose a little strip of millet between your wheat and cornfields, you will be able to get them to remain there long enough so that you can, by turning the millet under pretty deep, being careful to get every blade out of sight and at once harrowing the ground and rolling it, solve the problem.

There is another thing that I am satisfied you may also do, although it has never been tried, because I have seen so much that would indicate that it may be done successfully. That is to sow, as early in the season as you can, a few patches of millet in lieu of grain and in that way drawing off the females from your wheat to these patches. If you can find something more attractive to the female, that will draw her there to lay her eggs, she will go there. You could have something like that started pretty early and well up soon after the peach is in bloom, and you could draw off a great many of those females, that would otherwise go to the wheat to deposit their eggs.

I want to say one word about the remedy that we were sending out to you last year. It worked very well, last year, because it was working in damp weather. But you must not expect very much aid from it in dry weather. It is one of those species of plant life that thrives best in a moist atmosphere. If you can use it on low ground, where the soil is damp, it will multiply all right. If you happen to have a sufficient amount of rainfall it will work all right elsewhere.

Now, bear in mind these two things; burn off the rubbish in the winter; and sowing your baits in the spring, and make just as much out of them as you can.

Those are the only two points I can give you that will be of practical value to you next summer. Then I would ask you to watch very carefully in your wheat-fields, and if the weather during May or early June should be dry, then let us know just as quick as possible. We have had this pest in Ohio for the last three years. The first year in considerable abundance, the second year more wide-spread and destructively abundant, and last year as wide-spread, but destructively abundant only in certain localities; and strangely enough it has not in these three years worked two years alike in the same locality, over a large area. It has not been de-



MAP 1. Showing distribution of Chinch Bug in Ohio in 1894. Horizontal lines indicate area over which the bugs were found in limited numbers. Where these lines are crossed by oblique lines they were injuriously abundant.

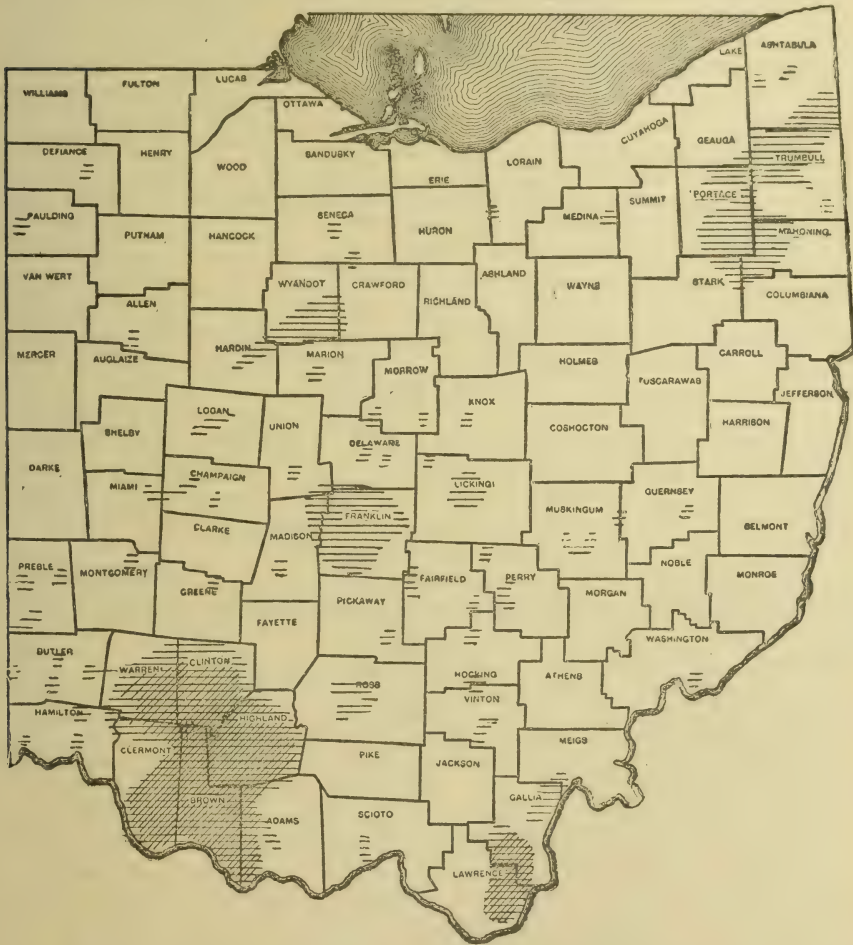
structive, generally, two years in the same locality. In 1894 the infested area was in this section (See map 1.), from Seneca county, shaped somewhat like a man's foot-print south to below Springfield, down pretty well to Clinton county, but being destructively abundant only in Wyandot county, as far as I have learned.



MAP 2. Showing distribution of Chinch Bug in Ohio 1895. Horizontal lines indicate area over which the bugs were found in limited numbers. Where these lines are crossed by oblique lines they were injuriously abundant.

The next year, (See map 2.) we have an area starting up here in Wyandot county, and extending southeast of Columbus and off to the southwest taking in extreme northern Clermont county, a rather peculiar area. Some injury was done over in the northeastern part of the state also. Now outside of these areas, except in a few cases, we did not have any serious trouble. Last year, (See map 3.) the trouble was scarcely to any extent in that area, but we had it principally in western Adams, Clermont, Brown, Highland and Clinton counties. Then we had another area over in Gallia and Lawrence counties, and in extremely northeastern Ohio there was serious infection. In the latter part of the country it works almost entirely upon timothy meadows. Now, this is all I need to say upon the subject of Chinch bugs. If there is any point I have overlooked, bring it out in your questions.

It would hardly seem necessary to talk to you about the Hessian Fly, something that you have probably known ever since you have been farming, and yet it seems to me that there is as much of a desire to learn something of this insect as there ever was. In fact there is a greater desire than ten or fifteen years ago. My correspondence is increasing every year, and the fly, judging from the ordinary agricultural literature is the great drawback to wheat growing in Ohio. Pretty nearly every injury to wheat is attributed to the fly, when a large per cent. is due to other causes. So far as the fly itself is concerned it is destructive, sometimes very destructive. It was last year. But it is not a serious pest every year, and I am going a little bit further and tell you that it is your own fault that it is a serious pest in any year. It is not difficult to manage if you will only take the proper measures and



MAP 3. Showing distribution of Chinch Bug in Ohio in 1896. Horizontal lines indicate area over which the bugs were found in limited numbers. Where these lines are crossed by oblique lines they were injuriously abundant.

pull together. It is one of those problems where it is almost useless for one man to attempt to carry out anything and his neighbors follow an opposite course. Now, for fear you may not all recognize the insect I am talking about I have had some of

them put up in these little vials in various stages and I ask you to take them and look at them.

With this insect, as with the chinch bug, there are two generations each year. The generation that is to cause the trouble in your wheatfields, next spring, is wintering over in what is called the flaxseed state, in the fields, in the plants, under the sheaths and just above the roots. Now, we call this the flaxseed state, because in color and form it somewhat resembles a flaxseed. It is from out of these, next spring, there will emerge those little tiny flies, which will deposit their eggs upon



MAP 4. Dates between the horizontal lines indicate, approximately, times prior to which it will be dangerous to sow wheat over area between such lines

the upper side of the leaf, the young hatching and making their way down behind the sheath to the joint, usually the first or second joint above the ground, there to absorb the juices of the plant and become imbedded in the tissues. It will ordinarily remain there until fall, when they will come out as adult flies, ready to lay eggs, but earlier to the northward than to the southward. There is a very interesting little point that you will understand, and that is this: the young must

have food as soon as it hatches. During the summer season there is no food for it, consequently it is a provision of nature that where the summer is longer they will remain longer in that flaxseed stage, in which they do not require any food. They emerge earlier in the spring to the south, but in the fall they emerge earlier to the north, giving a longer sleeping period in the extreme south where there is a longer summer and, hence a longer period of time during which there is no food. The adults are very short-lived. It is only a matter of a few days when they must die anyway, and their eggs must be deposited within these few days or not at all. The main portion of the brood will come forth within, probably, a week or ten days. They must have wheat plants or they become exterminated, and if you time your sowing so that your wheat is not above the ground at that time, you can see what you will escape. I have followed this through a series of experiments running over about four degrees of latitude and covering a period of five years before I came to Ohio, and every bit of information I have got since coming here has coincided with the results of these experiments. Now, in the extreme northern part of the State these flies will appear about the first of September, and they disappear largely before or by the tenth of September. In southern Michigan and the extreme northern part of Ohio and Indiana farmers can sow wheat immediately after the tenth of September and escape injury. Coming further south it appears a little later. The season advances northward in spring from southern Ohio at about the rate of twelve miles per day. Now, I have made these arbitrary lines (See Map 4.) on the degrees and half degrees of latitude, so that we may have some base lines, from which we can work, and they run about like this: North of this upper line, which runs a little north of Sandusky across southern Williams and southern Ashtabula counties, most of you can sow your wheat immediately after the tenth of September and escape the fall attack of fly. South of that you will need to delay later; south of this to the second line, wheat ought never to be sown before the fifteenth of September. Between the second and third lines, the latter of which runs north of Wooster where we have found that it is dangerous to sow before the 20th of September. Last year wheat sown the 18th escaped. Getting down to Columbus to the fourth line, you must delay a little longer. It is dangerous to sow wheat here before the 25th, and so on, until the extreme southern part of the State, you are in danger if you sow it before about the 7th of October. Now, there is a point here, which works just as regularly as clock-work, and you can save your money if you will. This will ward off the fall attack of the fly. Of course you understand that if you raise no flies in the fall you will have no generation in the spring; you have but to fight the one generation and in doing that you fight the second. If you so time your sowing that the wheat plants will not be above the ground when the fall generation of the fly has appeared, then you will have no spring generation to injure your crop. But suppose one farmer does protect his fall crop of wheat and his neighbor does not do it; these flies are not going to lay their eggs where there is no food for the young, and they are going on to the other field. You may protect your own crop but your neighbor raises enough to overwhelm you; but, if all in a neighborhood follow that plan you do not need to raise any fly, and you don't need to lose a bushel of wheat if you all hang together and time your sowing. There are only one or two other measures that it will be of any use for you to attempt. The rotation of crop is always beneficial, because you compel the insects to go from one field to another, and in wet weather most of them will die on their way. Then again, you have a piece of land where you are obliged to sow your wheat two years in succession on the same land, and when you do that, if you burn off the stubble before you plow, you will destroy a large portion of the fly, because they are summering over in the stubble. But the point you will make most out of, is in timing your sowing. That is perfectly practicable and it will work.

President Lazenby: The subject is now open for discussion or questions. We have about ten minutes that can be allotted to this, so that if any of you wish to ask Professor Webster any questions or have any points that will bear directly upon the chinch bug or Hessian fly, do not hesitate to present them promptly.

Mr. George Gill: I would like to inquire whether it would be considered desirable to burn over the aftermath on a meadow to get rid of the chinch bug?

Professor Webster: It can be done with perfect safety if the ground is frozen, but it would be unsafe to do it if it were not. And it would not be necessary to do so unless you are very sure that the chinch bug is hiding away there. That you can tell by an examination.

Mr. F. A. Derthick: I would like to ask in the case of grass, whether the same purpose can be served by cropping by cattle. Would that destroy it?

Professor Webster: It would destroy a good many, but I doubt if it would have the same effect, because there would be a good many that would escape the cattle. Then, in order to tramp it enough to destroy the chinch bug, they would injure the meadow. If you graze it off close it would take away the hiding places, but, as I say, the cold weather don't affect them very much.

Mr. Baker: At what period would you plow under the millet?

Professor Webster: You will have to go somewhat by your own judgment. When the chinch bugs begin to show any indication of leaving your plants then turn down. The idea is to get as many hatched as you can.

Mr. J. Wetherill: Is it necessary to burn over ground that is to be plowed early in the spring?

Professor Webster: Not if you are sure you will get it plowed before the bugs leave, and take the precaution to harrow and roll it. Ordinary plowing is done too carelessly. There are little clumps of weeds and stubble that form little ladders, whereby they will climb out. If you could plow your ground before the bugs had left these places and get the surface packed, it would do just as well.

Mr. C. W. Burkett: What time in the spring should we do that plowing?

Professor Webster: It is pretty difficult to tell you that. Last year would vary from a great many years. I presume the bugs would leave their hiding places last year the first week in April; perhaps this year they may not until the first week in May. It depends upon the weather. It should be done before very many real warm days. Now, I have put it tentatively, before the apples bloom. You have got to use a good deal of your own judgment.

President Lazenby: I wish to announce that in view of the great interest that is taken in the outbreak of the scale insect, the San Jose scale

in northern Ohio, arrangements have been made whereby Professor Webster will give a special talk on this subject on Thursday afternoon of the State Agricultural Convention, and I think that this is a subject in which you will all be interested.

THE PLACE OF THE POLLED BREEDS OF CATTLE IN OHIO.

By O. E. BRADFUTE, Cedarville, Greene Co. Ohio.

As one listens to the distant peal of chiming bells at this festive season of the year ringing out the joyful news and glad tidings of "Peace on earth, good will to men," there is to the thoughtful man a meaning that runs deeper than the surface and permeates his whole being.

For nineteen centuries has this glad refrain rung out upon the earth, and it is reserved to us of this century to witness something of the days of arbitration, and the fulfilling of those other prophecies when "He shall judge among the nations, and shall rebuke many people; and they shall beat their swords into ploughshares and their spears into pruning hooks; nation shall not lift up sword against nation, neither shall they have war any more;" and "The wolf also shall dwell with the lamb, and the leopard shall lie down with the kid; and the calf and the young lion and the fattling together; and a little child shall lead them; and the cow and the bear shall feed; their young ones shall lie down together, and the lion shall eat straw like the ox." How soon will all these things be?

But imagine, if you please, a farmer, who, having been in the midst of such a reverie by his fireside, upon going out into his barnyard finds the "boss cow" standing serenely beside the feed rack half full of unconsumed feed, mistress of all she doth survey, while in one corner of the yard stand the rest of the cattle trembling with fear, and in another lies bleeding his son's choicest high bred trotting filly, whose gaping death wounds plainly testify from whence came those blood stains on yonder cow's horns.

That man is a Christian if he swear not. But one thing he certainly doeth. He goeth straightway and getteth some rope and a saw, and to all practical purposes he beateth that cow's swords into ploughshares and her spears into pruning hooks, and she goeth to war no more. That man is a convert to the muley cow and needs no further argument.

As civilization has driven the warlike savage before it, so has it driven much of the savagery out of our domesticated animals. The cattle of civilization have shorter horns, our horses are less vicious and our hogs less savage. As evidence of this compare the shorthorn with the wild cattle of Chillingham Park or of our western plains; our American trotter with the wild mustang or our modern Poland China hog with the wild boar of the forest.

Following out this theory then, it is but natural that in Ohio where are produced men of the highest type of civilization, there also should be an early effort for the production of cattle without horns. If there is any spot on earth where the people on an average present a higher form of civilization than in the Miami Valleys, I do not know of it.

It is but natural then that in these same valleys we should find one of the greatest fountain heads for the production of polled cattle on the continent. Upon no other spot of the same size on earth can so many herds of the various breeds of polled cattle be found.

Being a native of one of these valleys and a lover of muley cattle, you will perhaps pardon the degree of pride with which I undertake to show the high place

the polled breeds occupy among the cattle in the state of Ohio and the influence they are having upon the cattle of the state.

The man who has once fed or stabled a bunch of muley cattle will never again wish any horned cattle about him, and he who has tried the natural muley will never again return to horned cattle which have to be dehorned. It is useless for me to enter into a discussion of the advantages derived from the use of polled cattle. They are conceded by all. The only question which seems to trouble many is whether or not the various polled breeds can satisfactorily take the place of the various horned breeds and give as good or better results.

To more clearly answer that question let us take up each of the leading polled breeds of the state and note something of their history and progress.

Late in the '70s and early in the '80s, the craze for dehorning and the organization and importation of the polled breeds began.

The unparalleled success of the then little known Scotch polled breed, the Aberdeen-Angus, at the Paris Exposition in 1878, in the hands of the late Wm. McCombie, brought them suddenly to public notice in this country, and importations to different parts of the country followed in rapid succession.

Two years after the importation of the first lot of females of this breed into the United States, Mr. D. N. Hine of Erie county imported the first lot brought into Ohio, and was followed shortly after in 1882 by Mr. Benton Garringer establishing a herd in Fayette county. Soon after came the direct importation of near one hundred head by Mr. C. R. C. Dye of Miami county, followed in rapid succession by the formation of herds by G. W. Perry in Champaign county, and the Meadow Brook herd by Bradfute & Son in Greene county.

From these five herds emanate most of the smaller herds now located in more than half of the counties of the state.

While the muley heads of the Aberdeen-Angus made them quite popular with the public from the start, there was quite a strong prejudice against their black color, and some one either from malice or through ignorance started the report that they were very poor milkers, "scarcely giving enough milk," he said, "to nourish a lamb."

The objection to the black color was founded upon an indescribable something in the mind which I have never heard fully expressed. But their marvelous success in the show yards at our fat stock shows and leading fairs and expositions, as well as in the feed lots and stock yards, soon knocked the color craze out of all lovers of good and profitable cattle.

I make the statement without fear of successful contradiction that a carload of prime Aberdeen-Angus steers of any age will bring more money in the Chicago stock yards than will a like number of any other breed in America. In proof of this I simply ask you to read the market reports; "the proof of the pudding lies in the eating."

Their success in the show ring is not less startling. At the great fat stock shows at Birmingham and Smithfield, England, the winning of the Aberdeen-Angus has become proverbial, as they have proven champions in nearly every show for the last ten years, while their success in the great show yards of America is little less marked. In proportion to their numbers they have won a larger per cent. of championship prizes over all than any other of the beef breeds.

During the fall of '96 they were awarded the Grand Sweepstakes or Championship prizes over all beef breeds at the Ohio, Iowa, Minnesota and South Dakota state fairs and the big fair at St. Louis, and tied in the committee at Illinois state fair. These constituted nearly all the leading state fairs where grand sweepstakes prizes were offered.

It has been left to the Meadow Brook herd of Aberdeen-Angus to win the championship cup over all beef breeds at the Ohio State fair for the last two years, '95

and '96, in succession, an accomplishment that has not in recent years, at least, been attained by any other herd of any breed, while at the leading county fairs throughout the state, the Angus have more than held their own. Upon several occasions within the past ten years have selected groups of cattle been sent out upon the great American fair circuit from each of the herds Woodlawn, Nickle Plate and Meadow Brook, and have convinced the cattle breeding public that Ohio can produce good cattle as well as presidents.

But what about that milk story? It may surprise some of you to know that only two years ago the champion milk and butter cow of all England was an Aberdeen-Angus cow, and that they rank very high as dairy cattle in that country. While it is a fact that there has been but little effort to develop their dairy qualities in this country, it is also a fact that there are many excellent milkers among them. Nearly every Angus man with whom I have conversed has expressed surprise at the excellent dairy qualities of the breed. Having had considerable experience with shorthorns as well as Aberdeen-Angus, I do not hesitate to say that I firmly believe the Angus to be fully equal to the Shorthorns as a milk and butter cow, both as to quality and quantity. I am assured by our herdsman who has spent most of his years with shorthorn cattle and has been connected with some of the largest and best shorthorn herds in America, that the Aberdeen-Angus as a class are the superior of the two in dairy qualities.

The Angus continues to grow in popularity throughout the state and there are now fifteen members of the American Aberdeen-Angus Association located in Ohio and altogether over fifty persons who are recording pure blood Angus from this state.

About the time of the first importation of Aberdeen-Angus into the United States, or perhaps some little time before, Mr. Wm. W. Crane of Miami county was carrying on a correspondence with some of the leading breeders of that breed in Scotland relative to the purchase of some of their cattle, but not being able to fully satisfy himself, turned his attention to the laudable work of building up a new hornless breed for himself out of the material already then in hands.

He first gave public notice of the work he was undertaking in 1881 and quite a discussion relative to the probable production of Muley Durhams sprang up in the Cincinnati Commercial during 1881 and 1882 which was participated in by Mr. Crane, L. N. Bonham and J. McLain Smith.

The scheme was to begin with the common native muley cow and cross with a pure blood shorthorn bull, reserving the muley calves and again using a pure blood shorthorn bull, continuing this process for five or more generations when it was believed that there would be a fixed type of muley cattle to all intents and purposes, practically pure blood shorthorn.

The scheme worked. A new breed was born and the world comes to the Miami Valley, the birthplace of the Poland China Hog, to see what things Mr. Crane, together with Messrs. Clawson and Shafor, have wrought with the cattle race in giving it the polled Durhams. Ten years from the first inception of the breed the American Polled Durham Breeders' Association was established in Chicago in 1889.

Mention should here be made that in the meantime Capt. W. S. Miller of Ottawa county discovered up in Wisconsin twin muley pure bred shorthorn heifer calves, and their brother, also a muley, all of which were of choice breeding, and at once hastened to purchase and bring them to Ohio. From this source came the pure blood shorthorn branch of the polled Durhams which now number over 250 head.

Between twenty-five and thirty Ohio breeders have stock recorded in the Polled Durham Herd book aggregating about 300 animals, with perhaps half as many more eligible but not yet recorded. Thirty per cent. of membership of the association are located in Ohio.

We are glad to note that the Ohio State Board of Agriculture was quick to recognize the merits of this new-born breed in giving it a class for prizes at the State Fair, being the first to do so. It is, no doubt, due to this important fact that the breed was able to obtain recognition at the Columbian Exposition in Chicago, where it was at once able to force itself into public favor and gained a world wide reputation by its success at prize winning in the general purpose class and carried off the grand sweepstakes for herd with fourteen herds competing. It is but fitting to say that the animals composing that herd were Ohio bred and a grand tribute to the builders of the breed.

You are all familiar with the form and character of the Polled Durhams as it is identical with that of the shorthorns, minus the horns.

Messrs. Crane of Miami, Shafor and Clawson of Butler, Ream of Champaign, Flossey of Union, Miller of Ottawa and Clark of Fulton county have been giving object lessons on Polled Durhams at Ohio fairs and are meeting with deserved success in the prize ring.

But we hasten to consider another general purpose polled breed of cattle that in the hands of Ohio men has played a prominent part among the cattle of America—that of the Red Polls, a pure breed of most ancient lineage and imported from England.

While breeders of the other polled races were busy laying the foundation of their herds, the Red Poll admirers were by no means idle. Mr. J. McLain Smith of Montgomery county and Capt. V. T. Hills of Delaware were importing select Red Polls from England and laying the foundations of herds destined to play an important part among the cattle of Ohio and of the country at large. Their continued success in the great American show yards gives strong testimony of the high rank which these men have attained for their favorites.

Coming to this country at a time when every effort was being made to specialize all our breeds of cattle, making them either beef or dairy cattle, the Red Polls found many who were not yet ready to submit to the special purpose idea and hailed the advent of a general purpose breed with delight, and this breed soon found many admirers all over the state. As a breed they "claim especially to excel as a general farm stock, suited to the needs of the ordinary farmer who expects to raise the male calves as steers for feeding and whose cows must yield a profit in dairy produce. For this purpose the cows must combine good dairy qualities with the capacity to produce steers of good form and quality for the butcher."

Thus far, however, in America the greater effort seems to have been made to bring out their dairy rather than their beef qualities, and the tendency is to specialize in that direction. So far as I am informed no Red Polled steers have as yet been fitted for any of the American Fat Stock Shows and very few have as yet reached the stock yards, but that they have taken creditable rank in England as beefers is without doubt, showing both good live weights and high per cent. of killing quality. On the other hand they have shown some excellent proof of their dairy qualities in this country and the Ohio cow has been much in evidence in this proof, as some of the best results yet attained at any of our public dairy tests in this state have been given by Red Polls. These tests show a large yield of milk giving a high per cent. of fat ranging from 3.5 per cent. up to 4.46 per cent.

The Red Polled men of Ohio are quite aggressive and quite a number of the members of the Red Polled Cattle Club reside in this state, and includes such names as J. McLain Smith of Montgomery, Capt. Hills of Delaware, Vaughn of Morrow, Andrews Bros. & Stormant of Greene and a dozen other progressive breeders located in different sections of the state, besides a large number of others not yet members of the club who are breeding and recording pure blood Red Polls. Altogether they represent a very active lot of stockmen in whose hands the merit of the breed is not likely to suffer.

This brief record of the place of the polled breeds of cattle in Ohio will not be complete until mention has been made of the newest of the Polled Breeds, that of the Polled Jerseys, also a child of the Miami Valley in Ohio. To Mr. J. R. Orr of Greene county belongs the credit of founding this new breed and hence he has the right to christen his as the Primus Herd.

His herd is founded upon the old Polled Jersey cow Daisy, a sport believed to be a pure blood Jersey. Her dam was imported by the late Prof. Haddock of Lebanon, N. H. Her sire was a son of Nonanetum Newton a J. C. C. 3177, his dam Nellie Dewdrop a J. C. C. 6017. Daisy's calves have all been muley and all her descendants thus far have also insisted upon being muley so that the type is now well fixed and a bull of this breed can now be counted upon for a large per cent. of muley calves from horned Jersey cows.

Mr. Orr now has associated with him in the work Messrs. J. W. Pollock, J. H. Collins and J. S. Brown, all of Greene county, and all of whom now have small herds. Independent of these gentlemen Mr. Chas. Hatfield of Clark county set about building a herd of Polled Jerseys, adopting the Polled Durham method, he used a pure blood Jersey sire upon native muley cows of extra milk and butter quality. He also succeeded in establishing a muley race of cattle.

The two branches thus started have now joined together and formed the American Polled Jersey Cattle Company which they organized at Cedarville Nov. 14, 1895, and the company was incorporated under the laws of the state of Ohio two days later.

There are now thirty head of Polled Jerseys recorded under this association and there are perhaps forty or fifty more eligible as soon as they have attained the sufficient age—one year.

The Primus Herd was shown with a good degree of success at some of our leading fairs of the state, including the state fair this last fall where they met some of the strongest Jersey herds in the country. At least four females of the breed have had a seven days butter test showing the creditable results of 16 lbs., 14 lbs. 5 $\frac{3}{4}$ oz., 14 lbs. 2 $\frac{3}{4}$ oz., and 9 lbs. 14 oz., the ages of the last two being three years and twenty-three months respectively.

In passing it is well to say that the cow Daisy, now a very old one, was at one time owned at Lebanon N. H., and afterwards at Newark, O., and probably left muley descendants at each of these places, but so far as is known no special effort was ever made to develop a muley race out of them.

The Polled Jerseys undoubtedly fill a long felt want and I believe they have a great future before them.

There was at one time a number of Galloways in Ohio but they do not seem to have become permanently established and I know of no herds in the state that are making aggressive efforts. They seem to find a more congenial clime in Michigan and the northwest.

There is being established at Atchison, Kansas, a herd of Polled Herefords, but as yet none have reached Ohio.

I also once heard of a herd of Polled Holsteins, but I do not now remember where they were located.

I have thus tried to give you as briefly as possible an idea of the place of the polled breeds of cattle in Ohio, both qualitative and quantitative as well as their place historically.

The breeding of polled cattle is no longer a fad. They are no longer an experiment. They come before the public resting on their merits and proclaiming their rights by deeds actually accomplished. They in their various breeds can fulfill every demand made upon the cattle tribe. There is therefore no longer need of the dehorning chute. Nature has met civilization half way and now the civilized man breeds cattle without horns while the barbarian breeds them with horns and then brutally saws them off. Civilization must and will triumph.

The President: We have listened to a very strong and earnest plea for the polled breeds, and we now have a little further time for the discussion of this subject. Remember the subject is "The Place of the Polled Breeds of Cattle in Ohio."

Mr. Newton Rector: The latter part of the essay suggests the point to my mind as to whether or not the members present will ever be able to follow the special directions, that is, to feed natural polled cattle. The fact is that there is scarcely a man present who will ever see the day in his time when he can obtain a load of polled cattle naturally for his feeding purposes. Now, it is a fact that the feeding of polled cattle is no experiment in this country. I live in Fayette county, the home of Mr. Benton Garringer's herd, and his herd has left its impress in that county, but to-day it is harder to obtain feeding cattle of the naturally polled class than it was a few years ago. Occasionally we can obtain a calf that sprang from Mr. Garringer's class of cattle, but it is only occasionally. Now then, my own experience for the last two years has been like this. Last year I concluded to feed a bunch of hornless cattle, and took some considerable trouble and paid more for my feeding cattle last year because they had no horns. This fall I was unable to obtain them without going to more trouble than I cared to get that class of cattle, and the result was this: For the same number of cattle we had to increase the box capacity just double, and the experience of feeding is not satisfactory at all, as compared with the other, even with the same quality of cattle. Now, the question to my mind is, following the suggestion of the essayist, shall we resort to the dehorning, or shall we feed less stuff in order to quell our consciences with reference to sawing these horns off? For my own part I feel like sawing the horns off. This is very barbarous. I never saw the operation performed in my life until the other day, I was gathering up a choice lot of calves and I concluded I didn't want the calves to grow up with horns and I went to work and sawed those horns off, and after we had gotten through with one or two, I felt like saying "Just open the gates and turn the calves out. It is too barbarous a method," but I stilled my conscience until I got to the sticking point to go on through the bunch. After turning them out and the blood ceased to flow, the calves went galloping off and they have never missed a feed. It was pretty severe, pretty hard on the calves, but I expect to have a better set of feeding calves on account of taking the horns off. I believe the time to do this is when they are calves, because of the fact that it is impossible for us to breed hornless cattle enough to keep up the supply. I do not know why it is that since this breed of hornless cattle is no experiment that they do not increase more rapidly than they do. Our experience is that it is harder to obtain hornless cattle than it was two years ago, unless you saw the horns off. I believe the time to saw the horns off is when they are calves. I do not think they will suffer so much while you are performing the operation.

President Lazenby: There is one very interesting point connected with the subject of dehorning, and that is the tendency to the development of the horn is prenatal, and if it is arrested in the young calf, as I understand is being very successfully done, we can have hornless animals without resorting to the barbarism of sawing off the fully developed horns. Of course, the fact that the horns develop after birth makes this admissible. If we arrest the development we arrest the tendency to produce horns in the progeny of the stock. Of course cutting off the tails would not have any effect in that way.

Mr. Larimer: I would like to say we have tried an experiment with two calves this year, they are now nearly a year old. By just rubbing a little caustic on the places where the horns should come, when they were about a month old—perhaps it might do just as well sooner,—there has been no development of horn or any other trouble whatever so far.

Mr. Reuben Rankin, Parrott, Fayette: Since Mr. Larimer speaks about it, a few years ago I knew of a gentleman where I lived, and he owned what was apparently a polled calf, and I asked him how it was bred, and he said it was a straight shorthorn calf, and I asked him how it happened that it didn't appear to develop any horns. He said that shortly after that calf was dropped he used a chemical dehorner; it was some kind of a caustic preparation, and that calf had no more signs of having horns than if it had been bred without horns.

Mr. J. W. Pollock: I suggest that that calf would have suffered just as much if allowed to grow horns two years old and then dehorn it. I have had experience with getting clear of horns. I have tried the liquid and I have used the saw in my herd, and I have abandoned both and concluded to breed them off. I think it is the humane way. However, if the gentlemen want to feed a lot of cattle and cannot get muley cattle, I believe they would be justified in dehorning. I do not want to have the experience any more. I dehorned a herd of thirty Jerseys, and we all like to have good Jersey cows, but so far as horns are concerned we parted friendship long ago. I will just say a word in the way of encouragement for those who wish to introduce this hornless feature in their cattle; it matters not what breed they are using, and that is, the hornless feature is very easy to propagate. There is no doubt about that. Experience has shown it. We get the horn almost entirely from the sire. My attention was first called to this twelve years ago when I was passing through the fat stock show at Chicago with a friend. We came across a couple of very fine, beefy steers that at once attracted our attention. One in color was a perfect iron gray, all over; the other was very much the same color except it had the marks of a Hereford in the face and flank, and we asked the gentleman who had charge of the steers if he could tell us how these steers were bred. He said he could, that one was a square cross between a Polled Angus bull and a Hereford cow, and the other was a square cross between a Hereford bull and a

Polled Angus cow. One had small horns and the other had a perfectly smooth poll. I asked him if he could explain that feature and he said he could. The steer that had the horns was sired by a Hereford bull, and he said that was the cause. He said that in breeding horned cows to a polled bull he would take off from 75 per cent. to 100 per cent. of the horns; whereas if you reverse the operation you won't get rid of any of the horns. So, introducing a polled bull into almost any breed, you soon get clear of the horns. You get clear of 60 per cent. to 75 per cent. the first cross.

Now, there is one thing in the history you gave of the Polled Durham, Mr. Bradfute. You spoke about Mr. Crane's having the idea that he could build up the Polled Durham by using a shorthorn sire with a native muley cow, but didn't he finally abandon that idea?

Mr. Bradfute: Yes, sir, I think he did. There is one thing Mr. Pollock brought out that I omitted to say in my paper. The gentleman speaks of the difficulty of securing muley cattle. It is a difficulty simply because people are not trying hard enough along that line. Any of the breeders of pure blood of the polled cattle will sell a man a bull and guarantee that from 80 per cent. to 100 per cent. of that animal's offspring from horned cows will be muleys; so you see how readily you can multiply your muley cattle if you wish to do so.

The President: We have another paper on our program for the morning session entitled "How Best to Breed and Feed for Mutton," to be presented by Mr. M. I. Todd, of Wakeman, Ohio.

HOW BEST TO BREED AND FEED FOR MUTTON.

By M. I. TODD.

It might seem presumption personified to discourse before an intelligent assembly of agriculturists on a theme so hackneyed as "How Best to Breed and Feed for Mutton," but it is not the part of a true soldier to question the wisdom of the commanding officer, whether the order be to go on drill, on picket duty or into the thickest of the fray.

The once languishing industry, of which my assigned topic is a part, is in the throes of a new birth. The ominous clouds of depression began to lift their deadly shades, when the people of the great République commissioned that matchless statesman and friend of our folds to lead our flocks into the green pastures and beside the still waters of the promised land of prosperity and protection. Our President-elect will be the first for a hundred years to emulate the example of Washington, by receiving at the hands of his countrymen the scepter of the greatest office in the gift of the most progressive people of the globe, clothed with fibers grown on the back of the American sheep. For several years, one sheep has been chasing ten men, but now we have the unique spectacle of ten men pursuing one sheep; and an old ewe, which will only so much as cast a shadow, will bring a royal premium in gold. In fine, within the circle of a single sun, the value of our thirty-two million sheep, the remnant of a hostile fiscal system, has been enhanced more than fifteen million dollars. The superlative "best," in our theme, should be considered rela

tive and not absolute, for what may seem best for me may be only good, bad, or indifferent for you, and what to-day, is best for me may be to-morrow consumed as dross in the crucible of my thought.

There are two distinct propositions in the question before us, viz.: "How best to Breed for Mutton," and "How Best to Feed for Mutton." The first proposition implies best dam and sire, which crossed will give the best animal to convert our grain and hay into money.

Let us first inquire what should be the characteristics of the dam. She should have a strong vitality, should be hardy and healthy; should have large capacity of assimilating food and converting it into milk, if hot house lambs are the aim; she must be a good mother having the maternal instinct developed to such perfection that she will desert her lamb under no circumstances; she should be gentle and tractable and these qualities should be innate, (to teach a sheep virtue is a tedious process and imperils one's morals); she should clip a good fleece of wool to add to the profits, but not of such a fabulous weight as to draw too heavily on her vital resources; she will of necessity be somewhat nervous, like the valuable dairy animal, and like her should be treated with excessive kindness. It goes without saying that to produce an offspring of good mutton form and early maturity, the mother herself should possess these qualities, at least in a measurable degree. Such an ideal animal, the dam of a mutton producer, to accomplish best results in briefest time on the scales and in the market, we can hardly expect to find at reasonable cost except in a cross of the Downs or long wools.

If it is desired to produce mutton for the most part in the open field and during the grazing season, more latitude may be given and a merino ewe large, well-formed and smooth, or nearly so, will give excellent satisfaction. There are points of vital importance in the offspring of the above type of merino ewe, over the offspring of cross breeds, for large flocks and protracted winter feeding. The merino is adapted to roughing it, being inured to hardship as far back as we can trace her history. She will withstand the attacks of parasites with a vigor that fairly makes the heart of the flock master leap with joy, when he has seen other breeds going down by the score under the ravages of these insidious foes of the flock, and notwithstanding the fact that he occasionally hears an epicure charging, with slanderous tone, that her mutton is too tough even for parasites to relish.

The grade flock or merino flock, may be made up by selecting ewe lambs of good form and ideal fleece, from best mothers of respective families bred to best mutton ram of those families, or by buying ewes and sifting them, using the first lamb as Babcock test, so to speak. It is possible by using proper foods and giving proper care to make use of the merino ewe for early winter lambs, and thus take advantage of the early development of the function of reproduction for which the merino is noted above all other sheep, save the Dorset. There is little gained, however, for from lack of milk, and tardy maturity the lamb will be distanced by one much younger, better nursed and richer in true mutton blood. A good ewe is too valuable to make her mutton an object of traffic, and as she is continually developing her invaluable maternal qualities up to the decline of old age, she should be kept until this period, which in the grade is seven or eight years and in the merino nine or ten years. The decline will vary with treatment. I have in my flock a Southdown grade ewe, ten years old, which has yeaned eight lambs, all sold at or before Easter; she seems yet in her prime and has never seen a sick day.

The importance of selecting a sire for mutton sheep cannot be made too emphatic. I believe a large percentage of farmers, who breed for mutton, use an animal that will closely fit the figure of Professor Shaw's scrub, delineated in a paper read before this society. The farmer may easily shrink the price of his lambs from fifty cents to one dollar each, by using a sire without reputation. This would be false economy and is too suggestive that the breeder's horizon is limited by the cir-

cumference of a copper penny. Pure blooded rams of the various breeds are too plenty and cheap to furnish any excuse for using a mongrel. In selecting a sire, I would reason from the progeny back to the parent, rather than from the parent to the imaginary and theoretical progeny; but if compelled to choose under the latter method, the breeder of whom I purchased should be, like Cæsar's wife, above suspicion. There are some unscrupulous breeders who can accomplish more improvement in their flock, in a day's work with the shears, than the scientific breeder could hope to secure in long years of patient study and selection. The purchaser of one of these frauds will hardly recognize his faultless animal, when he removes his fleece and exposes a narrow, retreating brisket, an ewe neck, an unsightly head, pointed shoulders, hollow back followed by a hump, drooping hips, cat hams, untwisted twist, hound loins and flanks and flat ribs. This shoddy animal, with his costly pedigree, would tempt one to forget some of the ten commandments. Our agricultural fairs should be schools to teach by comparison the merits of different breeds and individual animals and furnish an opportunity for selecting from the various exhibits an animal of intrinsic merit, by the eye; instead, they too often encourage the exhibition of a clipped, and pampered animal, a mass of blubber, whose carcass should be run into tallow candles, and whose pedigree record should be rolled into tapers to light them with. We are glad to know that the Ohio Agricultural Society is inaugurating a reform along these lines and that one may from its pens safely choose a sire without the long years of training required to receive a degree in the science of judging.

From what breed should we choose, is a live question in mutton production and the arena of the battle of the breeds is not a propitious place to cultivate tolerance, where the weeds of prejudice and fashion have attained so luxurious a growth; but let us be charitable and not fix our gaze too steadily on delicately poised chips on the shoulders of rivals while we glance at their claims for patronage.

We can hope to name no perfect breed. The perfect breed, like the perfect strawberry, has not yet been evolved. The problem of producing the maximum growth of wool on the maximum mutton carcass, has not been solved and this failure might suggest an axiom, viz.: the more mutton in the wool, the less in the caul and leaf. These latter are the index, at the block of quality, and determine whether the carcass brings pennies or dollars. As the ram is much more potent to transmit his characteristics than the ewe, we should discard the merino ram for mutton products. There may be fair profit in his crosses, but there is more in the crosses of the Downs and other mutton sheep bred for this special object through the centuries.

After twenty years of experience in raising Easter lambs, sired by rams of nearly every breed, and with as much study of breeds not used as my opportunities afforded, I should, all things considered, choose the Downs as the best mutton producers up to date, and, to keep close to my subject, I should keep my eye on the Southdowns. The fashion of the trade is drifting their way and there is now, only one fault that can be charged to them, lightness of fleece, and this is only indirectly germane to my subject, but is in perfect harmony with my axiom. I believe from all data within my mind, that these little sheep carry the most meat to the bone and waste of any of the mutton breeds, and, for hardiness, will score the most points. We acknowledge the Shropshire to be a very close second, and the Oxford with the tips of his hoofs well up to the line. The Dorset is also a close competitor, but he possesses no characteristics not found in the Downs, save horns, a less shapely carcass of rather poorer quality, a thinner fleece, and an alleged superior predisposition to arouse the latent functions of reproduction at all seasons of the year. We are very skeptical about this latter claim, for into a flock of one hundred ewes of a neighbor, one Shropshire and two Dorset rams were introduced and, of the first twelve lambs weaned, only three were Dorsets.

This year the two Dorsets and a Shropshire, over whom they were masters, were turned with sixty ewes. The result up to date is sixteen Dorsets and twenty-one Shropshires.

If blood tells, the Southdown has a legitimate right to the name of perfection, for his pedigree is well authenticated to the time of William the Conqueror. The foot prints of this little sheep, whose sinous path up through the ages has been so richly bordered by blessings for mankind, we are tempted to retrace, for we believe they would introduce us into the ranch of that incomparable breeder who first recognized the impressibility of the pregnant ewe, and put into practice the immutable laws of selection and heredity, evolving under his masterhand a flock of brown sheep the envy of all Palestine, and leaving in the folds of his father-in-law nothing but scrubs. Yet he observed every term of his contract, which was that nothing but ringed, streaked, spotted and brown animals should be his compensation for the care of the flocks. This piece of ancient history sounds very like the origin of the little brown Down, and this ancient breeder gives us an object lesson in the science of breeding without a parallel, for in six years he ruined the flocks of his rival, transferring all their good qualities into his own flock, and stamped every sheep with his brown seal. The modern professor may well take a post-graduate course in breeding for mutton, under the tutelage of Jacob.

The claim has been made that we must use a ram lamb for early maturity. My experience does not harmonize with this view. We find that not every ram will transmit early maturity, be he mature or immature. When out of the many we must reject, we find a ram of this invaluable quality, we also find that he will transmit this characteristic with uniformity, and we would not care to hazard a change every year to blow in money and please the breeders. We have treated the subject of breeding for mutton with the supposition that all mutton sheep, except superannuated breeders, should be sold before they drop their lamb teeth; when these drop it means a drop at the same moment of one cent per pound on your mutton, and besides, from this period on, the ratio of cost of maintenance must rapidly increase in proportion to increase of flesh; the coefficient of digestion or power of assimilation remaining practically the same.

We will now take up the second proposition of our subject—how best to feed for mutton. The ewe should be fed a ration rich in albuminoids to yeau a strong, healthy lamb. Oats, bran and clover hay meet the requirements. This ration should be widened with corn or its equivalent during the fattening period. We may not have reached an exact standard of meat production for our different grains, but we look forward with confidence, believing that the experiment stations, with their scientific accuracy, will give us such a standard. The Michigan Station demonstrated that corn, cornstalks and roots, form one of the cheapest and most profitable rations for the feeder, and that this ration supplemented with clover hay is a very close second. With this ration, it was also demonstrated, that a pound of gain could be produced by six and one-half pounds of dry matter at a cost of three and one-half cents, with corn at thirty cents per bushel, or roots at two and one-half dollars per ton, clover hay at twelve dollars per ton and cornstalks three dollars per ton; ratio 1 to 11. The Wisconsin station demonstrated the advisability of feeding from the time the lamb will begin to eat until sold.

The chief problem of the shepherd is the provision of such food as will keep the lamb steadily increasing in weight until sold. A variety of foods seems best to supplement the milk of the dam, when fitting lambs for early spring market. We keep constantly before them oats, middlings, cornmeal and whole corn, and clover hay *ad libitum*. For June market this might be changed to a ration of two parts oats and one part corn in bulk. Lambs for a long period of feeding should be yeaued in May and June to fit the fashion, which demands a smaller lamb than formerly. During past week one hundred pound lambs sold in

Buffalo at one dollar and forty cents per hundred less than eighty-one pound lambs. There are two methods in practice in fitting these lambs for market, the self feeding and the periodic.

In an experiment at the Michigan station the self feeder gave very unsatisfactory results. The gain was large, but was made at the highest cost per pound of any of the ten lots fed, and the profits came very near falling under the minus sign, only six cents coming to credit of each lamb in a period of four months feeding. It seems by this method the digestion is very imperfect. We follow the periodic method, using a ration of three parts corn and one part bran and all the clover hay the flock will eat up clean. This closely corresponds to the ration showing best results at Michigan station, substituting bran for roots.

A few rules should be observed in feeding without variableness or shadow of turning. Mutton and filth are hereditary enemies and there is no hope of a compromise. The yards, the troughs, the water and the air must be free from pollution; the fleece must be kept dry; the ration should be all the sheep will consume without going off his feed; salt should be kept constantly within reach, also water; each sheep should have from six to eight square feet under cover. Disregard of these rules will bring disaster and bankruptcy to the feeder, fill our markets with a worthless product and bring to American mutton a world wide disrepute. "Now good digestion wait on appetite and health on both," sang Shakespeare, making emphatic the underlying principle of development on which the feeder for mutton must depend for success. The past season has witnessed the greatest mortality among the flocks that we remember since our boyhood days, when a famine caused an excessive increase of grub in the head for lack of grub in the stomach. There have been various reasons advanced to explain this condition, but from post mortem examination we are persuaded that the prime cause is internal parasites. The low tone of health in many flocks will entail heavy loss, for an unhealthy sheep is an unreliable commission firm to which to send our grain and hay, and too often swallows up the proceeds and returns the freight bills unpaid.

The principle of laying down pastures so strenuously advocated by many writers cannot be too boldly censured; science has warned us, that these old pastures are swarming with germs and parasites. We sadly need an exhaustive treatise on the diseases of the sheep and remedies therefor. The work so well begun along this line by a Rusk, we hope to see perfected by a genuine practical farmer of ability and reputation, who shall supersede the present Secretary of Agriculture, with his crippling economy, and alien sympathy.

I am conscious that I have touched but a narrow segment in the vast circle of our industry. I leave the field to be surveyed by others, whose broader knowledge and riper experience will solve its intricate problems, trusting that the hints of this superficial paper may aid in lifting the mutton industry to a higher plane of profit, furnishing to mankind a more wholesome and nutritious food. I gladly acknowledge my obligation to the distinguished breeders and feeders, who have brought their practice within the domain of science, for I count science no prostitute, but rather the vestal virgin of American agriculture who forever keeps alive the flame of progress on the altar of civilization.

There being no discussion upon this paper, the President made several announcements and the Institute took a recess until two o'clock P. M. of same day.

AFTERNOON SESSION.

TUESDAY, JANUARY 12.

At two o'clock p. m. the Institute was called to order by President Lazenby, who said: The announcement was made this morning that the second paper on the program for this afternoon would be deferred on account of the absence of Mr. Crawford. It has since been learned that Mr. Crawford will be unable to be here at all during the session, but he has sent his paper and it will be read by Mr. J. H. Lackey, of Jamestown, Ohio.

I wish to announce the following committees: Committee on Resolutions, F. A. Derthick, H. P. Miller and L. P. Bailey; Committee on Nomination of Officers of the State Institute for the next year will be L. N. Bonham, J. W. Pollock and H. W. Phelps.

I was very much gratified with the order that was preserved this morning. As some of you are aware, this room is rather difficult to speak in. I now have the pleasure and the honor of introducing Mr. Alexander Galbraith, of Janesville, Wisconsin, who will address us on "The Draft and Coach Horse for America and for Farmers to Breed."

ADDRESS BY MR. GALBRAITH.

Mr. President and Gentlemen of the Farmers' Institute: I appreciate the difficulty of speaking in this room so that you may all hear. I would suggest if any of you find any difficulty in hearing what I have to say, that you "sing out," so I may raise my voice louder, and also that if in any of my statements or opinions you do not agree with me, as very likely you will not in everything, you make a note of it and at the end of my talk you put your questions to me, or give me your experience. I think it would be profitable and interesting.

The subject of my talk to-day was chosen by your Secretary and I think it a very appropriate and comprehensive one, that of the coach and draft horses for farmers to breed. It is now almost universally conceded that those two classes of horses comprise all that the farmer can profitably breed at the present day. Mr. F. J. Berry, of Chicago, who sells more trotting horses in Chicago than any other man, said the other day: "Let me say to breeders there are only two kinds of horses that it is profitable to breed at the present day, that is high class harness horses and the highest class heavy draft horses. These are the kinds that are in the greatest demand and bring the best prices."

I do not want to say a single word against the trotting horse or the trotting horse breeder, but I think the breeding of them has been a great injury to the country and to the individual. We have striven after excessive speed in the breeding of our road horses, and I think that in doing this we have sacrificed a great many excellent qualities in the horse, almost everything in fact except speed, and the fact that we get it so seldom—extreme speed—shows that it is not a profitable business for the average farmer to take up.

I will speak first of draft horses, because that is really one of the most staple articles on the farm, and it might be called the bread and butter element because it is a necessity. A carriage horse is a luxury. For the farmer the safest horse to pro-

duce has been the draft horse. Now, I have with me here to-day a few charts prepared at the University of Wisconsin for the teaching of the students there and for the Farmers' Institutes throughout the state. I will try to describe what is considered a model horse from an American standpoint. In Europe the draft horses are a little heavier than ours. A draft horse there means two thousand pounds. A draft horse here ought to be seventeen hundred or eighteen hundred pounds. If he is eighteen hundred pounds he will bring more than if he is seventeen hundred pounds, and if he is seventeen hundred pounds he will bring more than if he were sixteen hundred pounds, other things being equal.

Now, in the first place, here is the picture of a celebrated Clydesdale owned by a gentleman in Wisconsin. This horse took first prize four years in succession at Chicago. First of all I would speak of size. This horse in reality is not quite large enough, although weighing about eighteen hundred pounds. He ought to weigh eighteen hundred pounds in ordinary flesh, and in height should not exceed sixteen and one-half hands, in my opinion. I heard a man while speaking of large horses the other day, express his opinion perhaps more forcibly than gracefully. He said a horse over seventeen hands was too near heaven to be any good on earth. (Laughter).

I don't like a leggy horse, high up in the air. If he stands high it must be high independent of long legs. He must be high from the shoulder right down here (indicating), and have his legs not too long. Here is a horse with beautiful head and eye and ear. The model draft horse ought to be specially wide between the eyes, because only by that characteristic can you tell that they have brain power. They should not be broad at the top of the head between the ears, they should be narrow. The ears on this horse are a trifle too short. A great many people in this country like short ears, but there is a medium in that. We can have them too short very easily. The eyes should be full and clear and bright, standing well up. As the Englishman said they "ought to be so prominent you could hit them off." He ought to be wide in the nostrils, to have a good, lengthy, well-shaped neck, well arched into his shoulders. The shoulders ought to be oblique in shape. That is to say, they should not be straight up and down. If they are so the action of the horse is impeded. The shoulder being well set back allows free motion of those joints (indicating). Then his chest should be broad and deep so as to give room for lung power, although we find a great many wide chested horses that are not good movers because the front legs are on the outside of the shoulder instead of right underneath it. This picture shows the horse a little deficient in front muscle. A draft horse ought to have lots of muscle. That is the objection in this picture, I do not say in the horse himself.

The knees ought to be broad from a front view and the pastern joint of good length. These pasterns are very good but not first class. They ought to have a little more length to them. The foot ought to be good size, well shaped, prominent at the heels and of hard, tough texture. The back ought to be short, deep as well as round ribs, hind quarter level and tail springing well up. This horse looks deficient in muscle in the thighs, and that is a very objectionable thing in a draft horse. The most important part, perhaps, is the hock joint and this ought to be broad, broad from a side view and entirely free from fleshiness or suspicion of curb or spavin or any unsoundness, and in breeding horses you must see that your parent stock is free from these defects. The hind pastern should be set well forward, the object of this being, of course, to prevent concussion. You take a horse with a short pastern and put him on a paved street or hard macadamized road, and it is only a question of time until he bangs himself up and goes like a man on stilts; there being no elasticity.

Now, I have here another picture of another breed. This is a Percheron horse, owned by a Mr. Briggs, in Wisconsin. He took the second prize at the World's

Fair, and with the exception of his having a somewhat objectionable head and being a little short in the neck he is a very excellent draft horse. I do not think he is a typical Percheron. I think he is too short and his hind quarter is phenomenally long and level like the hind quarter of a Suffolk Punch.

I would say a word about action, because action in a draft horse is as essential as in any other kind of a horse, and first of all we must have a good walker. I see very frequently our County Fair and sometimes State Fair judges will allow a horse to trot round about them and then go up and tie the ribbons. I never could judge a horse that way. Unless you take a horse and have him walk away from you and walk him back, then trot him up and trot him back, you cannot tell whether his action is true or not. He may have a very faulty gait and you cannot tell anything about it by having the horse run around you. It is very essential that the horse should go straight and square and not throw his heels out, as many do, especially wide chested horses. If you put a horse in heavy draft you will find him getting wider at the hocks all the time.

Now, before leaving the draft horse, I would like to point out to you some of the advantages of raising draft horses rather than the finer horses. In the first place, the average farmer can do so without any special skill or knowledge or experience in raising them—and if a colt gets a little blemish or develops a defect of any kind, he can still sell him without very much depreciation. If a man is raising a fine carriage or road horse and he gets a blemish of any kind, however trivial, it takes off a great deal of his value; consequently if a man raised half a dozen draft colts and half a dozen road colts, he may get for the road colts, one or two high prices. He may get prices higher considerably than for any of the draft colts, but take the whole six together and you will find that the draft colts will bring the highest aggregate, and considering the earlier date at which they become marketable and the less expense in fitting and handling them they will pay him better. Therefore, unless a man has special knowledge and skill and facilities for raising the finer kinds of horses, he is safer in raising draft horses.

I would impress upon you above all things the raising of animals only from sound parents. Do not think you are saving money by patronizing a five dollar or ten dollar horse if there is a fifteen or twenty dollar horse near, if the latter is much better. It is short sighted policy. The man that aims high is going to attain success.

Professor Craig, of the University of Wisconsin, about six weeks ago got orders to buy a first class grade draft team. He went down to Chicago, and stayed there from Monday until Friday, nearly a whole week, looking over hundreds and hundreds of horses. He saw a single animal here and a single animal there, but they didn't match. There was something wrong about them. Nearly all were more or less inferior. On Saturday he went out about thirty miles into the country where a dealer had about one hundred head that had been shipped in and that were being fattened and prepared for the eastern market. Professor Craig found a good team there and bought them, paying five hundred dollars for them, and he could not buy them for any less. The team weighed sixteen hundred and seventy pounds apiece, thirty-three hundred and forty pounds. And right in connection with that I would state that Professor Craig wrote to the Breeders' Gazette afterwards—they had previously bought a team the price of which had been criticised as being too high—and he says: "I wish to emphasize the fact that they were the only satisfactory team of all that I had examined. The comment on the price may be expected to be very much the same as in the case of the mares referred to in these columns last week. But the question will not down. Where can as good a team be purchased for the same money? There are others who will pay as high prices for such a team, but there are no teams to be found. These prices are those that must be paid for good draft horses. The

prices that the general public use in forming an opinion are the prices that the raff bring in Chicago markets, and not the prices the dealers get for the good teams that they get together, as these are seldom reported and as seldom believed.

"The presence of so many misfits in the Chicago market is chiefly attributable to the fact that many of those rearing horses bred them to suit their own preferences rather than to meet the market requirements. The farm horse, meaning thereby a one thousand, two hundred pound horse that answers a part of a purpose on the farm and another fraction of a purpose on the road, has no other place than on the farm, and the market will not recognize him. Aside from the question of type in the market another feature was the complete absence of condition in the general run of horses that are marketed. When a dealer can pay ten dollars a month per head for feeding, or more properly fattening horses, does it not seem queer that horses will leave the farm, where there usually is an abundance of cheap feed, to go to market in a lean condition?

"While, in common with others interested in this work, I have always had faith in the ultimate revival of the draft horse industry, the experiences I have encountered have crystalized that faith into a creed, the articles of which I am going to note down as follows:

"1. It is evident that there is as much need for the heavy draft horse in our cities as there ever has been, and as business and population increase there must be a *greater* need than there ever has been.

"2. The present stock of draft horses in our cities is past the summit of its greatest usefulness and in less than five years it will have to be replaced.

"3. It is certain that no first class establishment using dray horses will wish to use second class teams; they must have, both for the profit and prestige of their business, as good teams as it is possible to buy.

"4. It is known that the supply of good draft horses is surprisingly small, and it is going to be smaller in succeeding years owing to the fact that few mares have been bred.

"5. Knowing that the use of the draft horse is as general as it has been heretofore; that the supply is about consumed and none immediately forthcoming; that the demand for good teams will prevail; and not knowing a single checkmate to any of these assertions, I cannot but conclude that the man who can and will breed good draft horses is subscribing to a business creed that will bring its monetary reward now and in the future."

Gentlemen, here is an argument which I think is simply unanswerable. There is not a point in it but what is absolutely true, and if any of you gentlemen will produce an argument to show that draft horses are not needed, either now or in the future, I want to know it. There is one point that he speaks of, that of condition, and it is an important one. The farmer I find often throws away what would be really a profit in sending his horses in an unfit condition into the market, and in proof of this I would like to read you a few lines from Mr. J. S. Cooper, a large dealer at the Stock Yards.

"During the past winter and spring months we received among others at least one hundred and fifty car loads of horses on consignments direct from farmers, and out of these a large number were in no condition to be placed on the market for sale. Fat is an important feature and adds considerable to the selling price of horses, and with our present enormous crop, unequalled in the history of the country, there is no excuse to justify the shipping of horses unless they are well conditioned, smooth and fat. We do not contend that fat alone will command high prices, nor that it will change the quality of the horse, but we have no hesitation whatever in declaring that it will increase the price ten dollars to twenty-five dollars a head, and recoup the farmer far more than the same expenditure on hogs or cattle, make him feel he is getting the full market value and make life pleasanter for his commission man."

That, gentlemen, is a very important matter, and I want you to consider it, because if you throw away your horses twenty-five dollars a head less than they are worth, while you have lots of cheap feed around the farm, you are standing in your own light; and, as Professor Craig says, if it pays the dealer to feed them at ten dollars a month, it will surely pay the farmer.

Now, I am going to talk to you again to-morrow and Thursday on the subject of the horse, and those talks, especially the one on Thursday, will include the causes of the present condition of the horse business, and, as I do not like to steal my own thunder perhaps I had better go on with something else.

We will pass on to the carriage horse, the "gentleman's horse." Now, the carriage horse, as most of you know, can be produced in a great many ways, and the production of them is a little uncertain even with the best. We have here a picture of a Hackney mare (referring to chart), a mare which I had the honor of importing for Mr. Stevens of Attica, New York, last spring. She was the champion mare of England and she is the finest mare of the breed at the present day in the world. This picture is taken in action, the mare is trotting, and, as you see, she has her feet high. The artist caught her just as she was going to stop. But the action is extremely high, both the knee and hock, the hock being exceptionally so. High hock action is exceptionally rare and very valuable, and in the carriage horse it is high and stylish but not rapid action that is desired. The Hackney as a breed is not large. The best are under fifteen-three, and I have never seen very many good ones over fifteen-three, the average will run about fifteen-two. Now, I do not know that I can serve any good purpose by going over this picture. The action really is the main feature in it. The animal is very perfect in form all over, the head, the neck, the shoulders, the limbs, the back, the quarter, everything is of beautiful form and in keeping, one part with the other. The carriage horse of today, as I have said before, can be bred a great many different ways, and the majority of our carriage horses are, of course, trotting breed. I think if the farmers of this country had set themselves to raising carriage horses instead of raising extremely fast trotting horses, they would have had money in their pockets and filled the country with good instead of indifferent horses. Quality is a very difficult thing to describe. An animal with quality will always have a nice head, bright eye and clean neck; clean and flat in the limb and fine in the hair; full of life and vitality. Their hair and skin are invariably fine, and a great many of our best carriage horses show considerable of the thoroughbred or race horse blood. The great drawback in using thoroughbred is that while you may get quality and style, you are liable to lose action. That is why we are breeding to the Hackney horse or French coach horse.

Now, of course, opinions will differ as to the best methods of raising carriage horses for the market. Every man's experience and ideas will differ from others. The Breeders' Gazette, I think, is a very fair paper to all breeds and stands up for the trotting horse as strongly as any. They say in an issue here which I got the other day: "The Gazette has steadily taught that the quickest and best way to breed carriage horses is to resort to a cross of the blood of the foreign carriage horse breeds. The position is impregnable. The facts of this contest, now made much of by trotting horse papers, fortify it still further. And it stands to reason. Our horses have been bred for speed and light road work; the foreigners have been bred to horse the heavy pleasure vehicles that the wealth and fashion of this country are now using. The harness horses with which Messrs. Hamlin have made their most conspicuous winnings at New York, were produced by an admixture of either French Coach or Hackney blood with the American trotter. This is the sensible, successful cross."

I think that is right, but it does not follow that we must all use those European breeds, but we must choose those strains, or families, that are of carriage horse

conformation. That is, we must use a horse of 1,200 pounds with a beautiful cut head and neck. A horse with a plain head can never make a carriage horse. But, if you get a good looking, well bred trotting horse, I see no reason in the world why we cannot raise as good a carriage horse as can be produced anywhere in the world. I was at the New York Horse Show in November, and I saw a good many excellent horses, single and double and four-in-hands, and the majority of them were trotting bred. Some were half Hackneys and others had a French Coach cross. But the breeder must be governed to a great extent by the kinds of mares that he has, and unless he has mares suitable for the breeding of carriage horses he had better leave the business alone. His mares must have quality, fine heads and necks and good disposition. They should be long and low, not leggy, and the ancestry should be very closely examined. The question of back breeding is a very important one. The back breeding in all of our animals is most essential. If you have one or two mares, or know where such can be got, you should get hold of them and breed them to the very best horse you can, with the qualities such as I describe, but be sure and keep good looks to the front, soundness above everything, and as much action as you can get. Our trotting horses don't generally have the carriage horse action, that is to say, they do not go the way a carriage horse ought to go. They ought to bend their knees and hocks like this (indicating), kink them, and if they can do that they are very valuable. It is a difficult point to reproduce. When you can get one to reproduce it stick to it by all means.

Now, I would like to say a word about feeding stock, and I will begin with the young colt, in regard to the care and feed. Our young colts do not get sufficient care from the start. I think that it is within the experience of a good many of you that colts often die the first week or two. They get sickly, swell up in their joints and die. They die from blood poisoning, from the absorption of filth germs at the time of foaling. One of the most successful breeders, Mr. Dunham, of Wayne, Illinois, for many years suffered a heavy mortality among his colts, and although he at first did not know the cause he finally discovered it. His colts dwindled and lost appetite and died. Sometimes the symptoms were rather different, but generally very similar. He found the cause and discovered a preventive and remedy, which is this: The stall where the mare foals ought to be kept most scrupulously clean. Every particle of filth and manure must be removed beforehand. The walls ought to be whitewashed, and when the colt comes they use a solution of bichloride of mercury on the naval cord of the colt. They use it repeatedly the first day then once a day for two or three times, and the result is that there is no sickness, no deaths. I think for the last three or four years Mr. Dunham has scarcely lost a colt. Previously he lost twenty or thirty a season.

After the colt is a few days old he may be turned out with the mare, provided the weather is dry, but if the weather is wet he is better in the barn, for the reason that his soft woolly coat absorbs moisture and it is apt to result in bowel complications. Then it is not right to work the mother during the suckling of the colt. I think it is asking too much of her, and it is a practice not adopted in Europe at all. The colt ought to be taught to eat grain and oats with the mother before weaning time, so that when he is weaned he won't fall off in condition. The flesh born on the colt ought to be kept on him all the time, and the first winter, especially, he ought to be kept growing and thriving all the time. Feed him liberally good sound oats, wheat bran, flaxseed meal, a few carrots, clean hay, and give him plenty of exercise, because if he keeps growing well the first year he will attain his growth much earlier.

I do not know how it is down here, but I presume it is pretty much the same here as in southern Wisconsin and Illinois. We are apt to feed too much corn. It is easily got, cheap and handy, but it is not good for young stock. It is good for keeping them warm, but not for the promoting of the growth of the frame, muscles

and bone, consequently I warn you against using much corn, except perhaps in very cold weather.

The cause of the present glut in the market is two fold. I am going to enter into this subject on Thursday. Over production is the main cause, and from over production we have gone to the opposite extreme of under production. The last three or four years there have been very few colts raised in the United States. I have traveled from St. Louis to New York and Montreal and wherever I go it is the rarest thing to see young colts, sucking colts, yearlings or two-year-olds, and from all reports breeding has been practically abandoned the last three or four years. If the law of supply and demand regulates values, and if the supply being greater than the demand at the present time, has brought down values, the opposite must be true when a shortage comes. If we do not produce horses we cannot have them, and those in harness to day in the cities have only about five years on an average to live, so that when they need replacement we shall have no source of supply. I think this is a serious matter. We are soon going to experience a shortage of horses. We have a shortage of good draft, carriage and coach horses already. They are valuable in every market today. Common horses are plentiful and very undesirable. Our street cars used on an average eighteen thousand horses per annum before the advent of electricity. These eighteen thousand horses seemed a good many, but against that we have an export trade that has sprung up in the last three or four years which dwarfs that altogether. In 1893 we sent across to Great Britain thirteen thousand horses, in 1894 we sent them twenty-two thousand, in 1895 thirty-four thousand horses, and in 1896, the year just closed, forty-six thousand horses. So that we send to Great Britain alone more than double the number we ever needed for the street cars, so you see that the street cars cut very little figure. And in the figures which I have given you I take no account of our exports to France, Belgium, Germany, Austria and other countries. They are taking in our horses free of duty, and I think it will be wrong on our part to ignore it altogether and not produce the kind of horses they want, the kind of horses I have been talking about. For carriage horses they want a little more bone and size than we can give them generally. All the good ones we have they will buy and pay good prices for them. Then they would take draft horses if we had them heavy enough.

Now, gentlemen, if you have any experience or ideas different from mine, I would like to hear from you.

A Gentleman: I should like to ask you if in selecting a horse for ploughing you would not prefer a leggy horse. Isn't his leverage greater than that of a short legged horse?

Mr. Galbraith: There is a medium in that. I do not think a leggy horse is desirable for the plow, strictly speaking. I think it is generally considered that the shorter legged horse is the most desirable horse for farm work.

Mr. R. H. Wallace: Professor, have you experimented with a mixture of corn meal and wheat bran as a feed for colts?

Mr. Galbraith: That is quite a good mixture, provided you do not use too much corn. I would prefer using some oats with it.

Mr. Wallace: Wouldn't that be a cheaper feed than the oats?

Mr. Galbraith: I do not know that there would be very much difference at the market value at the present day. In my experience the animals seem to thrive better on the oats feed.

Professor Noyes: Take it in sections where they feed lots of corn, are the colts and horses not shorter lived and do they not become blemished sooner than in other localities where less corn is fed?

Mr. Galbraith: I believe that is the case, and we find a difference between the Illinois horse and the Wisconsin horse. When we get Illinois horses up in the pineries of Wisconsin they don't stand the wear that the Wisconsin horses do.

Professor Noyes: Have they good feet?

Mr. Galbraith: I think if you feed corn largely it will eventually affect the feet. Anything that is heating affects the feet.

A Gentleman: A city horse ought to have good feet.

Mr. Galbraith: Certainly. A great many horses get a slight founder as we call it, and down go the feet. I would rather breed from a sound footed horse than any other.

A Gentleman: I would like to ask the color of the feet; you said nothing about that.

Mr. Galbraith: Well, it is a popular belief that the dark blue hoof is the toughest, and I guess it is, but in my experience in draft horses the white foot gave me less trouble than the black foot. It is a popular belief that white feet are soft feet, but my experience does not confirm this belief.

Dr. F. B. McNeal: I understand Mr. Galbraith to recommend very highly extremely high knee and hock action, saying it is preferred to any other action. I would like to have him explain why that is.

Mr. Galbraith: I was speaking of what is demanded of the carriage horse. The higher the knee and the hock action is the more valuable the horse.

Dr. McNeal: The question I want to get at is why is that true. Is it simply a matter of fancy or rather a point of utility?

Mr. Galbraith: Well, I do not see any great utility in a horse stepping high, but a man with a high stepping team will find there are lots of people that want to buy his team.

Dr. McNeal: Well, then, it simply becomes a matter of fancy?

Mr. Galbraith: Well, you may call it fancy, but it is not a passing fashion or fad, because there has never been a time in my recollection when a high action horse has not sold well.

Mr. Reuben Rankin: Are there not used in our cities as many horses as there were before they were displaced by the electric motor?

Mr. Galbraith: Yes, sir, that is what I understand. There are as many horses in use now as there ever were. You see the cities are increasing in population and spreading out, and the more they spread and the greater the increase of population the greater the number of horses used.

Mr. Rankin: Is it true that there are as many horses used in our cities as there were when they used them on the street cars?

Mr. Galbraith: They say the number is practically the same.

Dr. McNeal: I would like to follow my question a little further. Is it not true that the horse that raises his knee and has a very high hock action will strike the ground harder than the horse that does not step so high, and, as a consequence, will he not become stiff and sore?

Mr. Galbraith: That is a very good question, and on the face of it it would seem that he would, but, as you probably know, there are different kinds of high action. There is a kind of high action that can be produced, knee action, not hock action, and they will pound themselves to pieces; but the class which I speak of as an ideal horse has not got that labored action. They have a free motion of the shoulder. You have got to have the action of the shoulder as well as of the knee, and the class that I say I have in mind will go all day that way like a piece of machinery.

A Gentleman: I would like to ask how these horses travel down hill.

Mr. Galbraith: They go down hill just the same as they do on level ground, the class I speak of, the Hackney horse. It is bred in him. They will go all day up hill and down dale if you get one properly bred.

A Gentleman: Isn't it due to the entire texture of the animal, the vitality, the make-up of the animal in its breed?

Mr. Galbraith: Yes, sir, simply a characteristic of the breed. There is no animal that has low action that you are able to give high action to all around. You can increase knee action by heavy shoeing and otherwise, but not hock action.

A Gentleman: I would like to raise a question on the picture of the draft horse; the pastern joint seemed to be very long. Is there any particular advantage in that?

Mr. Galbraith: Yes, sir, there is great advantage in that. The horse you speak of would be all the better if he had an inch more pastern than he has. There is a tendency in heavy horses, as I said before, to go stilty. They will stick their toes in the ground. They don't have the elasticity which comes from the pastern joint. It must have good length and well set forward to give elasticity to the motion, and in the draft horse the tendency is to get shorter all the time. I have seen a few that were too long; I have seen a thousand that were too short.

Question: Do you consider corn meal good food for horses?

Mr. Galbraith: Corn meal is a food that is fattening, very dense, compact, and in order to feed it safely you must mix it with other feed: mix it with wheat bran and cut hay.

Mr. Harbage, Madison: We have one team of Clydesdale horses, three of them, that are rather leggy, and they work every day. We have another team of Percherons, that are low, chunky, apparently well built horses, but the boys prefer to take the leggy horses. They claim they

do more work in a day and do it easier and they do not have to be touched up quite so much as the short, chunky horses on reasonable loads.

Mr. F. A. Derthick : I want to support what Mr. Galbraith has said, in so far as the up or down action is concerned. There are several gentlemen in the room who were at the Chicago stock yards two years ago when there were ten horses sold in a very few minutes, and I remember a gelding that was brought out there that could not trot in three minutes, but the bidding started at three hundred and twenty-five dollars and it went immediately to seven hundred and fifty dollars, and it seemed to me if they would only wait a moment he would go to one thousand dollars. But he was sold. Now, immediately after that a horse was driven out that could trot in 2:40, about equal size and age, and sound, but he had this long, smooth stride that Mr. Galbraith speaks of, and it took two or three hundred dollars from the horse, although it could travel much more speedily than the chestnut horse. It lacked the grace, the elasticity that commended it, and Mr. John A. Logan, of Youngstown, bought the horse, and in the afternoon he bought a gray mare to go with it, and shipped them from Chicago to New York at two thousand, four hundred dollars. Neither was speedy, but they had that up and down action, that animated action that a man desires, and the question of utility didn't cut any figure at all. The horse had the appearance of going at 2:30 when it took him four minutes. (Laughter.)

Mr. O. E. Bradfute : If I understand Professor Galbraith correctly, he has endeavored to show us, not what kind of a horse to breed for farm utility, so much as a horse to breed for market.

Mr. Galbraith : That is the point. If we are breeding horses to sell we cannot satisfy our own individual tastes. We must produce what the market demands.

The President : The next subject on our program for this afternoon is a paper entitled, "The Successful Swine Breeder." This paper was to be read by Mr. James A. Crawford, of Xenia, Ohio, but Mr. Crawford is unavoidably absent and the paper will be read by Mr. J. H. Lackey, of Jamestown, Ohio.

THE SUCCESSFUL SWINE BREEDER.

By JAMES A. CRAWFORD, Xenia, Ohio.

In this day, when so many things are clamoring for our attention, when legislatures and trusts combine to compel us to market our choice products below cost, and with sharp competition on all sides, it certainly takes lots of genuine grit to be a successful swine breeder. In the discussion of this subject I have in mind those who engage in the breeding of live stock, as a means of pecuniary gain.

I think there are six things necessary—in fact indispensable—to successful swine breeding. First, admiration for the animal; second, knowledge of the business; third, honesty; fourth, good judgment; fifth, close culling; sixth, judicious

advertising. With these six horses harnessed to the same wagon, with lots of energy, economy, experience and with good business judgment and with the world and the markets before you, your success will be unlimited and as sure as death and taxes.

I want to say, in the first place, to every man who engages in the breeding of swine, or any other industry on the farm, don't keep any kind of stock unless you like it. If you have a white hog and don't like it, kick it out and get a red one if you like him. I don't believe any one can succeed in any business, however small, unless he has a love for it. Conditions are constantly changing and the demands of to-day are not what they have been in the past nor what they will be in the future. The swine grower must be well posted as to the relative value of his feeds; be able to use certain kinds of feed to produce certain results, and should study carefully the different subjects of feeding and general management, and avail himself of every opportunity of gaining information concerning the improvement of the breed he represents.

Some one has said, "Nature holds for each one of us all we need to make us useful and happy, but she requires us to labor for all that we get." In a great many cases people who plunge into the business of breeding improved swine, really know next to nothing about the requirements and limitations of the business. Success in this field must be worked out the same as any other. If money in the swine breeding business grew on bushes there would not be a dollar of profit in it—no, not in a hundred years. Whenever you see money made in any business it takes extra effort to get it. Men of brains, push and perseverance get there; the others—and I pity them—get there, too, but they are a long, long time on the road and the pie and cake, the peaches and cream are all eaten up before they reach the goal.

It is especially important, to make a profitable outcome of any business, that we first familiarize ourselves with all its details. The fact that one man will make a complete failure in a business while another takes the same business in the same place and under the same circumstances and makes a complete success, plainly indicates that there is something in men as well as methods. In the majority of cases there is more in the man than in the business. Hundreds of men have started in the business of breeding swine, with no other motive in view than that of making money. They buy, breed and sell anything in which there is a profit. In a short time they realize that to sell pedigreed stock, the reputation of the breeder must be a guarantee of the value of the pedigree and the breeding qualities sold. Their expectations never materialize, they fail to reap the profits they expected, and they soon vanish from the business like so many bubbles.

The breeder who succeeds is the man who has the improvement and the development of the hog at heart. He must be able to reason and remember. Some one has said, "It is not the sign of a wise man to never make mistakes but in never repeating them." Very few of us are so evenly balanced that we can look at a subject from every standpoint and march steadily up to the most correct and sensible conclusions.

The question often arises in the mind of the breeder, what proportion of the male pigs he raises should be sold as breeders. The custom to-day among many breeders is to place 50 per cent. of their male pigs at the head of good herds, 40 per cent. go to the farmer, and 10 per cent. are castrated, when the reverse should be the aim of every successful swine breeder. I am satisfied that not over 10 per cent. of all the males raised should go to head herds of reputation, and 50 per cent. ought to be put beyond the possibility of reproducing their kind, leaving 40 per cent. to be sold to the farmer. Now I will admit that part of the 50 per cent. would be better than the old time razorback, but are they a benefit or a fair representative of the breeder? The breeder cannot afford to send out these inferior animals even though he receive an inferior price. They stand as a representative

of his herd wherever they are sent and no doubt he has lost many a good order by the quality of the inferior pigs. Now I do not wish to ignore the relation existing between the breeder and the farmer, it is of mutual and fraternal interest, and the breeder who holds himself aloof from the farmer makes a serious mistake.

Supply and demand in all things regulate the price, and if all the pigs that would not sell for more than ten dollars or twelve dollars were castrated, we would get better prices for the good ones. Then again, if the quality of the ten dollar pig will not justify a higher price the buyer is not improving his hogs and the breeder is fixing a value on his herd and others will insist on buying in the future at the same "pork barrel" prices. It is one thing to lower prices, and quite another to readjust them with your customers. It is the "cheap John" man that is the first to get discouraged in the business. While speaking of prices the question was often raised during the past year, when long prices were paid for some extra hogs, as to the genuineness of the transaction and even the reputation of the buyer and seller has been questioned. And again, the question is often asked, are these high prices a benefit to the swine breeding business? For my part, I cannot see that these prices are detrimental to the business only when they are to manufacture prices by which an inferior animal is sold on the merits of those so called "boom prices" paid for sire or dam.

When Ormand, the great thoroughbred horse, sold for one hundred and fifty thousand dollars in Argentine, South America, the phenomenal price of forty-eight hundred dollars was paid for a shorthorn cow, the Eighth Duchess of Geneva, and over in England eight thousand dollars in gold was paid for one of those ugly, wrinkly, greasy Merino rams, and one thousand dollars just a few days ago was paid for a pet game cockerel that anyone could put in his overcoat pocket. And yet when a hog sells for a good round price some one is ready to kick and declare that the transaction is not genuine. One fact is very conclusive, that individual merit, coupled with good breeding, will command good prices, as is shown by the prices paid at public sales held last winter.

I believe the swine breeders of America are as honest, honorable, energetic and patriotic a class of men as can be found in the world to-day, and while no one ever questioned the high prices paid for superior animals in other classes of live stock, why should the swine breeders' honesty be questioned? I doubt very much if there is a more important factor in the success of the swine breeder than the reputation he has slowly built up by honest dealing, judicious advertising and a fair representation of his stock to his customers. And I believe there is no business in life where sound judgment and untarnished honor is more essential than in breeding live stock, and the swine breeder who once earns this reputation has a stepping stone to his fortune. There are plenty of men to-day who can raise good pigs, that do not possess enough business ability to get their money out of them. Ten years ago all sales were made privately, but to-day the public sale seems to be the popular plan of selling. It certainly takes away one of the unpleasant features of the mail order business that causes so much dissatisfaction between the buyer and seller. In conducting a public sale the breeder must be perfectly fair and frank in all his dealings and even "the appearances of evil" must be avoided, that his honesty may not be questioned.

The breeder who expects to hold a public sale and receive satisfactory prices must have his stock in such condition as to look attractive, so that neither apology nor explanation is necessary. If you breed and raise what the market demands, you need not fear overstocking it, there are more consumers than producers. To-day the market demands, and is willing to pay, good prices for all the good live stock produced, if it is properly placed before the public. He who wishes to be successful must remember that even the best live stock will not command its value at private or even public sale without careful presentation of its merits to those who are

willing and able to purchase. Now the question naturally arises, what is the best method of advertising. There are three ways, which I will mention, that will aid very much in bringing the good qualities of stock before the public.

First, by advertising in live stock journals; second, recording in a good record company; third, exhibiting in the show ring.

A man's success in disposing of his surplus through the live stock journals depends upon the attractiveness of the advertisement, honest merit and a willingness to send stock worth the money received. Of what benefit will it be to a breeder, if he raises the finest bunch of pigs in the world, if he does not let the public know of it by putting guides out in the way of advertisements, pointing to his herds and their merits, that customers may come and examine his stock or reach him by mail. If you expect to hold a public sale how can you estimate the value of two or three good buyers who have been induced to attend through an advertisement and who probably will be the means of making the sale a success?

Who can over estimate the value of tracing an animal's ancestors to some good reliable record company and especially a company that will not record every cheap John pig that wants to root his way into good company for the small admission fee charged by some companies at the entrance? I am glad there are some record companies that will admit only animals of high merit and that will have a good high fence built around them for protection of those who enter and who are willing to pay the admission fee. I think that the day is not very far distant when the individual merit of our hogs will depend a good deal upon the reputation of the company in which they are recorded.

The show ring has been the means of making many breeders prominent in their vocation, has stamped success upon their reputation as breeders, and has assisted in disposing of many of their choice animals at good prices. When good, honest judges are employed it is one of the best ways to ascertain the individual merit of the produce. The successful swine breeder is enthusiastic in advancing the breed he represents—smothers the spirit of selfishness within him and works for the interest of every brother breeder.

How often, when a breeder is at the head of his profession, he looks back at those who are yet in their infancy and beckons them onward with a feeling of interest in their welfare. But if they should succeed in advancing to that point where they keep even pace, or perchance should pass him by the way, how soon jealousy gets control of his better judgment and he will be found planning some way to trip them or some unfair means to outstrip them in the race.

In swine breeding, as in other things, there is no excellence without great labor; the prize is in plain view to those who realize that there is within the realm of the possible that which can repay the man or woman who is intelligently bent on success. A little more persistence, a little more effort, and what seemed hopeless failure may turn to glorious success. There is no failure except in no longer trying; there is no defeat except from within; no really unsurmountable barrier save our own inherent weakness of purpose. Every person carries within the key that unlocks either the door of success or failure. Brother swine breeders, to each one of you I ask the question, *What shall it be?*

The President: If there is no discussion upon this paper we will pass to the next on the program which is a paper entitled "Peach Culture in Ohio," This address is to be given by Mr. William Miller, of Gypsum, Ohio.

PEACH CULTURE IN OHIO.

By MR. WM. MILLER, Gypsum, Ohio.

On receiving a copy of the program I was impressed with the fact that my paper was the only one on the list upon a horticultural topic; that perhaps I would be the only horticulturist present, and to be made to talk fruit culture to those interested only in general farming, would be both a punishment to them and embarrassing to me. The fruit grower who has so totally abandoned farming—as many in my locality have done—looking at this program will conclude that “polled cattle” are as destructive to young peach trees as the long horned Texans; that the place to judge of “mutton breeds” is when they are served upon the table; the “draft horse” is too large for his purpose; his interest in “swine breeding” is centered in the two pigs confined near the packing house where they live on the waste product of the orchard. The “wool industry,” the “silo,” “forage crops,” and the “pedigree of the horse,” are unknown quantities to him, and of interest only as they help to create a demand for his product. It would not be surprising if you who represent larger interests should walk out and leave the field to the few fruit growers present.

Yet there is this compensating thought, though the live stock and general farming interests may be larger now, we are fast becoming a fruit eating, instead of a meat eating people. The other profitable farm interests create less competition than ours; that Jersey cream is necessary to the highest appreciation of our product, and that an old sheep pasture makes the best place in the world to plant a peach orchard.

The importance of peach culture as one of the great industries of the state is at once recognized by a reference to the statistics of production in the several counties. These tables will also show where this industry has received the largest attention from the farmers of the state and incidentally will point out the localities best adapted to its production.

For several years Ottawa county has led in the total amount of production. Last year so many of her trees took a well earned vacation, that Athens and probably some other southern Ohio counties exceeded it in production.

What little I may know of the production of this fruit was learned in one of the lake counties, and of the methods and practices there in vogue I purpose only to speak.

The first ventures in commercial fruitgrowing in that locality were made early in the “sixties” in growing the Catawba grape. Observing men were not long in discovering that the same climatic conditions required for the successful growth of that fruit, would also be favorable to the growth of the peach. From small beginnings then made, the business has grown until nearly all the land suitable to the growth of this fruit has been planted to trees. As to how successful it has been, we challenge any other agricultural community of like territory to show as many tidy, well kept, and comfortable homes. The farms are small and the homes near together, permitting a larger social intercourse than is the rule in most agricultural communities.

It is a level country and the soil is mostly a heavy clay loam. Much of it is not more than ten or fifteen feet above the level of the waters of the lake. Similar level lands not in proximity to bodies of water would be the least desirable for peach culture; but here the lake to some extent modifies the climate. The water of the lake holding much latent heat modifies the extreme cold of winter. The slowly melting ice in spring retards the advancement of vegetation until danger from frosts is over. In autumn the water, retaining much of the summer heat, keeps away frost until bud and wood are well ripened, enabling both to stand severe cold. These favor-

able conditions are such that fewer failures of the crop occur here than at any point east of the Rocky mountains. The peach is a native of a more temperate climate, and to be successfully grown in this latitude must be planted where excessive cold will not cause too many failures of the crop, or the winter killing of the trees. Probably the only territory in Ohio where commercial peach growing can be safely ventured upon is the lake region mentioned, and some of the hill regions of the south part of the state. The conditions in these different localities vary so greatly that methods applicable in one locality may be radically wrong in another, but there are some things it is necessary to observe everywhere if commercial peach growing is to be made successful. Competition is already keen in this business and in the near future must become more so, and only those who grow the best, and take advantage of every improvement will succeed. We mention only some of the things learned in the school of experience where twenty-five years of study and practice have made some things familiar.

For a commercial orchard, trees should always be purchased in the fall. Then the nurserymen have a better supply of all varieties and a better selection can be made. Trees from the thick nursery rows are not well ripened, and need careful treatment to get them through the first winter without injury. Few nurserymen care for them as they should. The best way for the grower is to buy trees in the fall, select some dry location and heel them in deeply, having all the roots in contact with the soil. As cold weather approaches cover the whole top with soil or other covering to the point where it is to be cut off at planting. This protects the trees from excessive evaporation, as well as from severe freezing. By having them at hand in the spring, planting can often be done long before the nurseryman can deliver his trees. Early planting is an important point. Clay lands should be plowed in the fall, as the mellowing by freezing will allow of better as well as earlier planting. On our level lands we plow so as to plant the trees on the ridge in the center of a narrow land. This assists in drainage and makes a deeper mellow soil for tree roots. The trees were planted one rod apart in all the older orchards. Now the tendency is toward a greater distance.

The selection of varieties is a very important matter. Many have lost a year of time in learning that the list of varieties which should be planted in a commercial orchard is a very small one. Some of the finest peaches like the Globe, Wheatland, Susquehanna and others, do not bear enough to be profitable. The fruit of some of the best varieties is too tender for shipment. Others ripen at a time when larger and better varieties are in the market. When the objections are all in, the list of profitable market varieties is small. The first plantings in our locality were largely of the very late varieties, seeking to find a market after those grown farther south were out of the market. But it has been found better to select such sorts as will ripen all through the season. It enables the orchardist to keep labor better employed and consumers better supplied, and makes harvesting a business the season through. Plant few varieties. In this the motto should be that of the famous old Roman, "Not many things, but much." In our locality the Smock, Salway and Late Crawford exceed all others in the amount of fruit harvested. The phenomenal success of the Elberta has created a large demand for trees of that variety. So far it is the best all around peach grown. A list suitable for one locality might not be the one which should be selected for another. Varieties do not behave alike in all localities; markets are not alike in their demands, and no list can be given which is adapted to all localities. A good rule is to plant the varieties your nearest successful neighbor has found profitable.

The selection of the best varieties which can be found, and planting them on the best site, will not alone make a profitable orchard. Three other things are essential, and each is of great importance. They are pruning, thinning and cultivation. The pruning should begin before the tree is planted and continue during its

productive years; but it is most important that it be well done for the first three or four years. The roots may be pruned before planting, much more than is generally supposed. Much of the tap root and most of the laterals may safely be cut away. If all root pruning is done in the fall, before heeling in the trees, the wounded surfaces will granulate during the winter, and root growth begin much earlier in the spring. At planting time the top should be pruned to a straight whip not more than twenty-four or thirty inches high. With modern implements of cultivation there is no need of having the tops formed as our fathers used to, so as to allow a horse to walk under the branches. By forming the top low, there is less danger of injury from high winds, and because the fruit is near the ground the expense of harvesting is much less. The pruning the first year should consist in shortening the leading branches of the last year's growth, leaving them distributed along the stem left at planting time. Avoid having the branches radiate from a common center. If properly distributed along the trunk, a branch broken by wind or an over load of fruit works no permanent injury to the tree. Pruning after the first year should consist in shortening the main branches so as to form a short, jointed, compact head. Continue this shortening process each year, doing the work when the wood is dormant. In this way the tree will be kept low and the fruit within easy reach. Low trees will support all the fruit a tree ought to carry; the expense of ladders will be saved, the fruit can be more rapidly harvested, and at least ten years will be added to the life time of the tree. If vigorous growth is allowed each year without shortening, in a few years the weight of the fruit is borne at the end of long branches, which are sure to break with the first load of fruit, destroying the tree just when it ought to be in its prime. Many make the mistake of thinning too much the small twigs from the inside branches. They will bear as good fruit as is grown on the tree; nature will indicate when they ought to be removed. Much of the work of thinning the fruit may be done by judicious shortening of the annual growth. This can be done in winter when work is less crowding.

What should be done with an old bearing orchard, which has not been trained up in the way it should go, and bears fruit only at the extremity of long spreading branches—a condition existing in many orchards in all peach growing localities? My answer would be to head back severely. Should a crop failure follow, it will give the trees a chance to make ready for better crops. If a good crop follows, only the proper amount of thinning will be done. In no case will a mistake be made. Such severe pruning should never be done after the flow of sap has started in the spring, but always when the wood is dormant.

No greater calamity can befall the peach grower than to permit his trees to over bear. With a total failure of the crop there is no loss of labor and fertility. But with an over load of small fruit no profit comes to the owner, he loses labor and packages, and worst of all the ripening pits rob the soil of its fertility.

Ten years ago the question was often discussed as to whether it was best to cultivate the peach orchard; but it is no longer an open question. The up-to-date orchardist would as soon plant corn in his meadow and expect a crop as to expect a peach tree to produce good results in a like situation. The benefits are not always apparent the first year, but continued growth must be secured if we are to expect continued cropping. It is common practice to plow away from the trees in the spring, then harrow the ground, and, by the middle of June plow again, this time throwing the earth towards the trees, leveling the ground and doing all after cultivation with the harrow. Some successful peach growers do not plow at all, but loosen the ground in the spring with the disc or cutaway harrow, doing all after cultivation with the same tool or a common harrow, aiming at all times to have a mulch of mellow earth upon the surface. As soon after every rain as the ground is dry enough to work the harrow is started to break the crust and renew the mulch at once. With proper treatment of the soil, irrigation is necessary in this climate.

It was an old theory that cultivation should cease by midsummer, that the wood might have time to ripen well before winter, but it is found that it is better to continue cultivation until the fruit is about to ripen. This is especially advantageous in a dry season. It is the new growth started after an interval of rest that is too tender to stand the winter. If kept growing all summer the wood will ripen and fruit buds develop in good quantity for next year's crop.

All the labors I have mentioned will appear as child's play to the peach grower compared with the perplexities which will overwhelm him when he comes to deal with the insects and diseases which prey upon his trees and their product. He will realize as never before the meaning of Adam's sentence "Cursed is the ground for thy sake. In sorrow shalt thou eat of it all the days of thy life." Perhaps the peach tree grew in the garden, and being near, received more than its proportion of the curse. When the peach grower has labored with the borer, the curculio, the bark beetle, the leaf curl, the scab and the rot, he cannot repress the wish that Adam had behaved himself. Just now our home growers are excited over the discovery that for seven years they have been harboring and spreading—without knowing it—that worst of orchard pests, the San Jose scale. This, added to those we have had to deal with for years, might lead us to despair, but for the fact that man was given dominion over "beasts and creeping things;" and the man who lets these things have dominion over him is unworthy the name. Perhaps they are blessings sent to develop the man.

Methods of dealing with these pests do not come in the province of this paper. Our experiment station workers are telling us how, and in doing it they are keeping up the reputation of the Ohio man for keeping at the head of the procession.

After having grown the trees, pruned, thinned and cultivated and kept insects in subjection, the work is far from being done. To know when and how to pick, pack and market requires watchful care, good judgment and business ability of no mean order. To do these things properly and in time, the grower needs to have all things ready; the wagons in order, the packages on hand, the labor employed, the packing house ready and the market provided. It is better to have too much help than to permit fruit to get too ripe for want of labor to care for it at the proper time. Where the grower is obliged to call to his aid that necessary evil, the commission man, it is well to have him ready also. Select one firm in the town, where you expect to market your fruit, of known good reputation. Ship to one firm only. If you use the commission man right, and do your part of the work as it should be done, you will not often have cause to complain.

In our county the growers have organized shipping associations at several stations from which fruit is shipped, each with a manager whose sole business is to look after the grading, packing and marketing. The members simply gather the fruit and take it to the packing house at the station. Here it is graded, and each grower given credit for the number of bushels of each grade he has brought. The individual is known no further. The fruit goes to the company's stock and is sold by the grade. At the end of each week, an average is made of the prices obtained during the week for each grade, and each grower is given credit for his share of the proceeds. This method of marketing has proved very satisfactory to the members of these associations. It gives them time to devote all their energies to the proper management of their orchards and careful handling of the fruit. One member complains that the individuality of the grower is lost; that he can acquire no reputation for himself nor for his own fruit; but this is an age when combines and corporations swallow up the individual, and the fruit grower must take his chances with the rest.

Will peach growing be overdone, is a question which has been asked over and over again, and never with greater apprehension than now. The low prices which have prevailed for farm products for the past few years have led the farmer to look

about for some crop which will bring better returns. In many localities peach growing seems most inviting. The oily tongued tree agent has told his story of fabulous wealth in the peach orchard, and the trees have been planted on a larger scale than ever before. What shall the harvest be? Let us see. Many will be planted on soils and in localities not adapted to their growth. Some where market facilities are not good, and the expense of marketing so bulky and perishable a crop will be too great. Some will plant trees who belong in other avocations. The faint hearted will be discouraged. A few failures will send the rainbow chasers to other fields. It will be the old story. Some will fall by the wayside, some among stony places and some among thorns. Good crops and good prices will not always be obtained. Periods of production will not last long.

On the other hand, the planter who keeps abreast of the times, makes the business a study, learns the wants of the market and aims to supply them with the best that can be grown, may congratulate himself on having a pleasant and profitable occupation. The crowning glory of the business is in its small workings, enabling a man of small capital to undertake an independent business. And it is one in which he will have ample scope to exercise his skill as a workman, to use his wit and judgment in planning his orchard campaigns and to develop his mercantile abilities in making his daily sales. He does not rely on his boss to do his thinking and furnish him employment. He is free from the orders of an employer, superintendent or foreman. Opportunity is given to strike out in his own lines and to develop his own originality. It will result in the development of both brain and brawn, and of profits in excess of the salary paid for like ability in other avocations. Peaches cannot be grown or harvested by steam or electricity. The individual is not subordinate to the machine, as in many occupations. There will always be a market for good fruit. To him who aims to produce only the best, the orchard will bring forth some a hundred fold, some sixty and some thirty.

President Lazenby: This very interesting and suggestive paper is now open for discussion. I know Mr. Miller will be very ready to answer any questions, if any of you wish to ask him any questions, upon peach culture.

Mr. Scott: I would like to ask the gentleman what is the cause of "yellows" in peach trees, and if he has a remedy, what it is?

Mr. Miller: That is a hard question. I have asked it a great many times myself. I do not know.

Mr. Scott. My question is brought out from a little experience I had myself. I had some trees that every year had been troubled with the "yellows," and last spring I told my wife I was going to cut them down. I had seen so much discussion in the agricultural papers that I concluded they would never do any good. She said, "No, let them grow," and this year they were loaded with fruit. I thought certainly there must be some cause, and there must be something that would benefit the trees that would save them from destruction.

Mr. L. N. Bonham: I would like to ask the gentleman to describe the "yellows." If he has trees that live some years after having the "yellows" and then become fruitful I would like to have him give me a description of his kind of yellows.

Mr. Scott: In the spring the leaves would come out on this tree and become well developed and then take on something like an insective

ailment and all the leaves of the tree become yellow and the fruit would drop off. The trees seemed to be perfectly healthy as far as the bark and wood material were concerned.

Mr. Bonham: Curling of the leaves?

Mr. Scott: Yes, sir, a curling of the leaves. The fruit would entirely drop off.

Mr. Miller: The chances are that you didn't have the "yellows." I never heard of a tree recovering from that disease. I have had considerable experience myself, but I have never heard of a tree's recovering. We frequently have this leaf curl in the spring, which causes the fruit to drop and later the leaves to turn yellow, but that is not what is known as the "yellows."

Mr. Bonham: My object in asking the gentleman this question is that I inferred that his trees didn't have the "yellows." We have had that ailment of the dropping of the leaves of our peach trees, but I am sorry to report that I have discovered "yellows" in my trees this spring. It is a very different thing. I was led to examine my trees after receiving the bulletin from our experiment station on that subject. If any one wishes to study the character of the "yellows" I advise him to communicate with the experiment station on the subject of peach "yellows." On examining my trees I found two or three. It was at the time of fruiting. I had one tree that we had grown from a seedling. The peaches had been sent to us from a distance. It was the first year of its fruiting. I think the tree was five years old. Upon one limb I noticed it, and upon that limb the peaches were red to the core. I didn't know the name of the peach, but it was an early and nice variety. On looking along the limbs of the tree, there were a great many sprouts on which the red peaches grew, and there was a great many red leaves, and I thought this disease, after examining that tree and two other trees I found on my place, was a misnomer. The name was wrong. It ought to have been called the "reds." It is misleading. I had often suspected that something like the "yellows" caused the fading of the leaf. To the brother over there I would say the remedy is to destroy the tree, root and branches, and burn it; for dragging it through the peach orchard is said to communicate the disease to other trees. Now, the question of interest to my mind is, how did that tree of mine take the "yellows?" The theory is that even fruit disseminated in market in boxes, the seeds from that fruit taken and planted on your farm, will bring the disease to your farm, and that is the way it came to my farm. We had never had anything like the disease on the farm, and have never heard of any in the neighborhood, and since this came to my notice I have examined other orchards and I do not find any there. So I am satisfied that the theory is correct that even boxed peaches from "yellows" trees will disseminate the disease. While I am on the subject I would like to ask Mr. Miller to tell us about the San Jose scale on the Island, how much territory it covers and how long they have had it?

President Lazenby : I would like to say in answer to that question, before Mr. Miller takes the floor, that owing to the interest there is in this subject at the present time, Professor Webster has consented to speak upon it briefly on Thursday afternoon in the general convention. I make that announcement now so that all who are present may bear it in mind. We will be very glad to hear from Mr. Miller :

Mr. Miller : At the December meeting of our county horticultural society, one of our members spoke of a singular appearance of some of the fruit in his orchard, and which had been noticed for several years. He said it appeared to be covered with a sort of honey-dew, and he didn't know what was the cause of it. Some of the trees seemed to be dying. I told him the description of the insect, a description I had read of the San Jose scale, and that anyone finding similar symptoms in his orchard should be in a hurry to find out the cause of it. A few days after that I received a letter from Professor Webster, saying that this gentleman had sent him specimens of the San Jose scale, from peach, pear and plum trees. Those trees were planted in 1889, making it one of the first cases occurring west of Cleveland. I believe the Department of Agriculture at Washington first had its attention called to it in 1893. In this orchard the scale seems to have been spreading in all directions from this little pear orchard. For a distance of about a half a mile, making a mile in diameter, or three miles in circumference, nearly all of the trees are affected with it. Some of the trees have died, and others are covered with the scale.

Mr. Bonham : Is that in one township ?

Mr. Miller : That is all in one township, Catawba Island.

Mr. Samuel Taylor, Franklin : We have lost, in the last two or three years, probably three or four trees with some kind of an insect that stings the body and cuts it full of holes from two and a half to three feet above the ground. We have lost peach trees and one or two Richmond cherries. I would like to know what the cause of it is.

Professor Webster : That is what we know as the fruit bark beetle. If the gentleman will look after his trees pretty closely he will find there is something the matter with the roots, in other words, that it does not attack perfectly healthy trees.

The President : We must confine our remarks to the subject in hand, that is, peach culture in Ohio. While there are many interesting phases of insect and fungus diseases we must confine ourselves to the subject. Some of these topics will come up and will be discussed undoubtedly before the close of the Institute under other heads.

Mr. Scott : I would like to ask Mr. Miller whether he uses any mulch for his peach trees or any fertilizer ; if so, what kind it is ?

Mr. Miller : We try to use a mulch of mellow earth and keep the trees mulched in that way. Our soil is a strong, loamy clay and we have used but little commercial fertilizer in any way. We try to avoid the

use of nitrogenous minerals. We find it is not beneficial to trees. If I could procure wood ashes in abundance that would be the kind of fertilizer I would use.

Mr. Scott: I would like to ask whether you plant in the fall or in the spring.

Mr. Miller: If I knew just what kind of a winter we are going to have and knew it would be a mild one I would certainly plant in the fall, but as I said in the paper, the trees are not well ripened always in the nursery row and it is a little dangerous in a severe winter.

A Gentleman: Would you advise buying trees of a traveling man or of a good, responsible nurseryman? (Laughter).

Mr. Miller: Responsible nurseryman, of course.

The President: If there is nothing further on this subject, we have, as those present are doubtless aware, a list of questions and as we have a little time still at our disposal we might, I think, very properly take up some of those questions. The first question is:

"Which is the cheaper method of bringing up a farm, by buying fertilizers or by feeding nitrogenous foods to live stock?"

Mr. H. Warren Phelps: That depends on the kind of soil. If I had a clay soil I might use commercial fertilizer, but I think in all cases it is cheaper to produce the fertilizer by feeding live stock. I think it is cheaper for the present to buy the live stock and buy the feed to produce the manure than to buy commercial fertilizer. But often the farmers are not able, financially, to purchase feed, but they can often purchase the fertilizer on a little time until they can raise a crop. It all depends on the circumstances of the farmer, but I think the cheapest and best way, and I have had some experience in improving clay soil, the cheapest and best way to get fertilizer is to buy the feed until you can raise enough to feed the stock. That has been my plan.

Mr. Larimer: I would like to ask whether this would include the use of clover as a fertilizer?

The President: I should think it would, nitrogenous food.

Mr. Larimer: I have been experimenting on a field of twenty-five acres for ten years, by sowing clover on the wheat in the spring and turning that stubble and clover under every fall, late in November or early in December, then planting to corn next year and following with wheat again and sowing clover again and in that fall turning under the clover and wheat stubble and planting corn again; and I have plowed the field five times, raised six crops of corn, five crops of wheat in succession, and the land is in much better condition to day than it was ever before, and I would say it is considered old, worn out land. It has been farmed for eighty years, part clay and part black ground. What I wish to get at is, whether I could increase the fertility as fast by sowing clover every other year and then plow it under without cutting it off, and losing a crop? I have increased the average crop of wheat from sixteen to

twenty-eight bushels, and the corn about one-fourth. I think I can increase the fertility of the land and lose no crop. I have plowed it deeper every year, and it was plowed just a month ago, about seven inches deep. By gradually deepening the soil and keeping the land open, so that it will absorb all the rain water that falls on it and the snow that melts, and the rotting of the clover and the stubble keeps the ground open and enriches it. I do not know how long I can follow the same rotation, but I think as long as the crops will increase, anyhow.

Mr. Seeds: I wish the gentleman would give the location and the kind of soil he cultivates. Where I live we have clay subsoil and the soil is clay. If that applies to our case we think we will try the remedy.

Mr. Larimer: The land, as I said, is part clay and part black land. It is Fayette county. The land is on the dividing ridge between two creeks, the highest land in the neighborhood, the field I speak of, and the subsoil is mixed with a little gravel, a little limestone gravel, and by turning that up every year I think I get all the lime I want on the land.

Mr. Reuben Rankin: I would like to ask Mr. Larimer if in getting his catch of clover he was not benefited some by the use of commercial fertilizer?

Mr. Larimer: I suppose I was; I do not know. I use commercial fertilizer. I think I got a benefit on part of the wheat, perhaps, that way, but as it was an old, worn out field I was willing to give it all the chance I could.

Mr. M. I. Todd: As I understand this question, we are not talking quite to the point. I want to know where we are going to feed nitrogenous food in order to obtain fertility in the soil, or I want to know if we are going to obtain fertility by using commercial fertilizer. That is the point and it is the great point with me, for my land is a white clay land, regular white-oak clay, and I have been feeding stock for twenty-five years on this land, and I cannot commence to get enough manure on this land and I have to use commercial fertilizer. It has been to me a blessed thing, and I thank God that he has put this stuff in the earth for me, for I have raised my crop of wheat on this land from sixteen to twenty-five bushels, and, moreover, I can get a catch of clover after using this commercial fertilizer without a failure, for I never fail to get a good catch of clover after using commercial fertilizer.

"Question: Which is the greater injury to the soil, selling wheat or timothy hay from the farm?"

Mr. Larimer: My experience has been that it would be more injurious to sell the hay. We never raise any crop that takes as much fertility off the land as timothy hay. If I get a paying crop of wheat I do not consider that I sell as much fertility.

Mr. Albert Hale: My experience has been that where farmers raise lots of timothy hay to sell they do not raise large crops of wheat. I know a farmer in my neighborhood, who used to be one of the best

farmers, I have seen thirty-five bushels to the acre on his farm that to-day don't produce an average of fifteen bushels. I attribute it to the amount of timothy hay that he has sold off of that farm. It passed into the hands of a man who don't raise sheep and very few cattle, and he sells a great deal of timothy hay and he don't use any commercial fertilizer, while the fact is that when those great crops of wheat were produced they were using liberally of commercial fertilizer. And I have seen other cases in my own neighborhood, and I think it will hold good in most cases, that where a great amount of timothy hay is sold off of a farm you don't see good wheat crops, though I have seen wheat crops of thirty-five bushels to the acre that was sown on plowed up timothy sod; that would be the exception, not the rule.

The President: Mr. Bonham, have you something to say on this subject?

Mr. Bonham: I think not. It is simply a choice between two evils, and which would bring ruin sooner is a matter somewhat depending upon the soil.

The President: As we have quite a list of questions and the program seems quite full we will pass over them rapidly. The next question is: "What are the best crops for young orchards?"

Mr. Samuel Taylor: As this is a question I am very much interested in I would like to hear from Mr. William Miller or anyone that has raised fruit. My experience is that on a young orchard potatoes or some hoed crop is best for the first two or three years, not longer than three years. After three years' time my experience has been that the trees shade the ground and it is not much use to put in any crop. We have put out quite a good many crops and we have never farmed them but two years unless it was raspberries. We set out principally quince, plum, cherry and pear trees; no apples, hardly.

Mr. Miller: The best crop to be raised in a young orchard is trees. Make that the first business. While sometimes we grow corn in our young peach orchards I do not believe it best, but it has been my practice the first year to cultivate the trees until about June. I do not believe it is profitable to grow any kind of a crop in the orchard the first year. I had a little experience in growing raspberries in a peach orchard and from the detriment that they were to that crop of peaches they were the most expensive crop I grew, and I will never be guilty of growing any kind of a crop again in a peach orchard.

Mr. Taylor: I just simply mentioned the growing of raspberries between the trees. I would not recommend it, because it is not a success. I think it is a failure.

A Gentleman: I would like to ask Mr. Miller if it would be profitable to grow clover at least some of the years?

Mr. Miller: Perhaps it might be profitable for one year if the conditions were such that the trees needed to have their growth checked. If

they were growing too fast it might do, but not under any other conditions.

President Lazenby: It has been recommended by some fruit growers that what is termed a cover crop, that is after the orchard has been cultivated during the growing season, the early part of the year, that some crop should be sown. Crimson clover is recommended, and other crops, simply as a cover crop during the winter to keep the soil covered. I would like to ask Mr. Miller or anyone who has had any experience of this kind in an orchard, whether it has been found beneficial?

Mr. Miller: I have not done that myself, Mr. President, but intend to hereafter. Some of our orchardists have grown crimson clover. This is considered very good, if you can get it started. The trouble about growing it is to get the seed to germinate during the dry weather in August. Some orchardists sow rye, and I think it an advantage in preventing a waste of fertility during the winter.

After some announcements the Institute took a recess until ten o'clock A. M. Wednesday, January, 13.

MORNING SESSION.

WEDNESDAY, January 13.

President Lazenby called the Institute to order at ten o'clock, A. M., and after making some announcements, introduced Mr. John N. Jamison, of Roxabell, Ohio, to speak upon the subject, "Field Arrangement and Crops for Growing Healthy Swine and Improving the Soil."

ADDRESS BY MR. J. M. JAMISON.

MR. PRESIDENT AND GENTLEMEN OF THE CONVENTION: In appearing before you this morning on this subject, as you have it on the program, first you can see the chart of my farm (referring to a diagram), the arrangement of the various fields. The letters are probably too small for you to read them. In the first place when I platted the farm or arranged the fields, my object was to get it in good shape for cultivation, and for handling the crops. When I had done that, and came to think over the matter, I found it was in the best possible shape to handle my hogs from year to year. This centre field is a permanent pasture, running around in this neck. This branch cuts off a neck of four acres here that is not fit to farm, too much of an elevation, a narrow strip between the branch and line, so that the best use I could make of it is permanent pasture. Here at these dotted lines I put in temporary fences, when necessary. I usually farm the fields north and south of these lines separate, a part of this and that field, and make a turning row on dotted lines. You will also notice that each field is tributary to my permanent pasture, that I can go from the permanent pasture by gateway to anyone of the other fields, making it convenient and handy to handle stock.

Now, as to the crops I grow, or the rotation. I try to follow a three years' rotation; that is, of corn, wheat or rye, and clover, and in doing this, in handling the hogs, I also rotate the hogs from field to field, as may be necessary.

Last year this field (indicating) was in rye, and I wanted to "hog it down." At the barn was my feeding place in the morning, and as soon as the feeding was done I passed them out and let them cross the permanent pasture to the rye field. I fed them in the morning as long as they cared to come for the feed. If they got enough rye or grass not to care to come to the barn for slop, I let them stay out. I watched them closely, and when the rye began to fail, and they would follow me to the barn, I fed them again.

With a crop of corn I grow a crop of pumpkins. Grown in corn, it is the most uncertain crop we try to grow. Sometimes we get a good stand and a good crop, and again very few. Sometimes the fodder shades them too much so that they make no growth, and if they have plenty of vines they may fail to set. In the summer of 1895, in my corn (some thirty-five acres) I was able to get only three or four loads of pumpkins, but in the summer of 1896, on forty-four acres of land, I grew about eighty tons of pumpkins. I plant them every year with the corn. It may be of interest to you to know how I plant them. I use a two-horse corn planter, with boxes that will hold about a peck each. With seven quarts of corn I put in about a quart of pumpkin seed, from a pint to a quart; and mix these through the corn, and the working of the machine back and forth throws out the seed. If you are not accustomed to it, you will be surprised how few hills of corn are missed, or how few hills are all pumpkins.

In my growing swine, my farm being only eighty-six acres in extent—usually I have fattened about one hog to the acre each year. Last year I fed forty hogs, one-third the number I should have had to consume the crop of pumpkins. It is a nice thing to talk about such a large crop of pumpkins, and a nice thing to have them. But when I came to harvest or gather them, some eighty tons or one hundred and sixty thousand pounds, all of them must be gathered before I could seed the land, the question came to me whether or not I could not have supplied the solids of those one hundred and sixty thousand pounds with less labor, but still I like to have the pumpkins. Nearly 90 per cent. of them being water, of course the hog consumes a great deal of water in eating them to get a small amount of solid matter.

It might be well for me to tell you how I feed them. The general feeling over the country, particularly among old people, I believe, is, that pumpkin seeds are injurious to hogs or cows. Last fall I noticed in one of the papers that in some parts of the state of Ohio the farmers, in feeding pumpkins, had lost their hogs on account of the amount of seeds the hogs had eaten. On account of this report that went over the country, the probabilities are that for the next twenty years there will be some farmers who will cut the pumpkins open and clean out the seeds before tossing them to the hogs. So far as I am concerned, I find no detriment in feeding pumpkins whole as they come from the field. There is a right way and a wrong way to feed them. There is a right way to feed corn to hogs, and a wrong way. In feeding pumpkins to hogs, I want to feed a few at a time and get them accustomed to them. When they are accustomed to them I only throw out what they will clean up before the next feeding time. This is the proper way. I toss them over the fence, usually, and if they don't burst open I take a corn knife and strike them once or twice to open them. You will notice that when a hog goes to a pumpkin, the first thing he does is to clean out the seeds and strings. Then he will eat the body of the pumpkin. The trouble with those men who lost their hogs from feeding pumpkins was this: they probably had an immense amount of them, as we did, and to get rid of them they hauled them to the field and threw them out by the wagon load, they burst open, probably half of them, when they threw them out, and the hogs, probably, had not had anything but grass. When they went to the pumpkins the first thing they did was to fill up on the seeds. If you will examine the analysis of pumpkin seeds, you will find them very strong in fat or oil.

This being the fact, and the hogs filling themselves full of them, they could not digest them, consequently they killed them. It wasn't the fault of the seed at all, but of the men and the way they fed them.

Now, another thing in utilizing this crop: I always feed the pumpkins first. Last summer I had this field (indicating) in corn, twelve acres. I harvested some twenty-four wagon loads of pumpkins, probably twenty-seven tons, off the field. Along this side of the permanent pasture, some of the vines ran out between the corn and the fence; there is probably a vacancy of five feet between the fence and the corn, and the pumpkins on these vines went over the fence first to the hogs; as I didn't need to feed the hogs the stock corn this year to help digest the corn, I jerked the corn or husked it, and built two pens to feed in. The corn came on about the same time the pumpkins did. I fed a few pumpkins and a little corn each day. I always fed the pumpkins first. I aimed to feed early in the evening at that time of the year, going past the hog lot and throwing out what pumpkins I supposed they would consume by dusk, and then go and feed the corn.

You may think that it is a strange idea to do this. Why not feed all together? If you have handled hogs much you will know that they are always ready for corn, that they will eat corn as long as they can eat, as long as they can hold it. I have found that by feeding them all the corn they want they care but little for the pumpkins. And in feeding them that way I would get more corn consumed than I would pumpkins. If I fed the pumpkins first and let them fill up on them, I found that they were always ready for corn, in that way I got large quantities of pumpkins consumed; otherwise, if I fed them corn first, I would not, probably, have got half as many pumpkins used up.

Another point. I thought I could get more corn consumed in that way than I would without feeding the pumpkins. It seemed to enlarge the digestive organs, so they could handle more of it.

In securing health to swine on the farm, there are many points to be considered. I believe one of the great troubles in this country, and their dying with so called cholera, is the feeding of too much corn. There are not the elements in the corn that are necessary to produce growth. You may lay on fat; you know that when you lay on fat in excessive quantities the hog's powers are weakened and he becomes more liable to disease. Now, if we can feed in some way so that the hog gets the necessary elements for building up his whole system, for five out of seven months that we keep him, then we have two months to lay on fat, and take the chances of getting the disease, of getting too excessively fat and exposing himself to disease. Of course, in keeping him healthy, there is one point we want to keep in mind, and that is, keeping him *clean*. He should have good, clean, fresh water, a good wallow, good shelter, good shade, and good pasture, and we want to remember that in growing hogs it is as necessary for a hog to have grass as it is for the ox or horse. Most men in growing hogs have the idea that the greatest thing is to get the grain consumed, to get the corn crop out of the way. Gentlemen, when we come to consider or believe that grass is as necessary for the growth of swine as corn, then we will probably have struck the key note to health for swine.

It looks like a good deal of travel for my hogs in the morning, to leave my feed-lot here, travel sixty rods to get to the rye pasture or clover, and to go over that field to travel fifty rods more during the day. It is undoubtedly necessary in growing a young pig for him to have exercise. It is necessary for him to have exercise to properly develop his muscular system, and it has been found in making a test of this matter, that by giving him exercise, he will consume a greater amount of food and make a greater proportionate gain. Last spring I had a bunch of hogs that weighed about two hundred pounds. They were up about the barn in lots. I wanted to keep them until along in May, or the first of June. I moved them on to the rye field and fed them ninety bushels of corn. The hogs were not weighed when then

went on; but my judgment was that they exercised too much, that possibly I lost half the corn I fed them. Now, if they had been used to exercise, the possibility is that they would have gained all the time, but they had not been accustomed to as much exercise as I gave them in that field. If my pigs, in passing over one field to get into this one, must pass over a dry road without any verdure or any grass, then I would consider that every day that they made that long walk, it was detrimental to them, but as there is a good growth of tender fresh grass on the field, blue grass, timothy or white clover, and the hogs eat as they go, I feel that it is no detriment to them, that the exercise is a benefit.

Now, there is another point. We hear a great deal about hogs being troubled by intestinal worms. I have slaughtered hogs before now that had intestinal worms, and their intestines were pierced full of holes by these worms. They pulled apart very easily. They are detrimental to swine if they wound the intestines, and if the worms are present there is danger of cholera. Now, if there is any way to get rid of these worms, then we have gained a point towards health. A few years back my attention was called to the fact that much can be saved in grain by feeding hogs salt and hard wood ashes; that these help them to digest the corn and build up the bone and muscular system. When I found this was the fact, and that 20 per cent. of the corn could be saved, it would be a profit to me to feed wood ashes and keep it by them. I commenced to feed wood ashes, and I aim now to keep wood ashes and salt constantly where they can get it. Now, I seldom notice a hog that coughs, or worms pass from them, so that I am gaining in health in that direction.

Coming back to the matter of water for swine, you will notice this red line that passes through the lower part of the farm shows the stream. Some men would say I would like to have that close by the barn; it would suit me better; the stock could go out and get water. I prefer to have it here, as I shall show you hereafter. Now, here is a spring, another here, another here, and so on, (referring to plat of farm.) At this line here, in the fall of '95, when it was so dry, the water would stop running during the evening, for probably two or three rods back from this fence, but down here the water was always running; over there, the water was running in a stream probably as thick as my wrist. My land is what might be called white-oak and burr-oak clay; up here is some clay with some black land; probably three feet down there is a little limestone gravel mixed with the clay, this is the bed of the stream. My hogs go out there to wallow, and they always have a clean wallow. They can go to the spring if they wish, and always have a good, fresh, clean, clear cool drink. Up here (indicating), tributary to this stream, there is a tract of land, probably two hundred and fifty acres, that takes up a part of three farms. All of these men are swine growers, and I get the water from that land through my field. Probably fifty rods back here, the water ceases to run in dry weather, except when there is a hard rain. My neighbor has lost hogs two or three times; his hogs run on the same stream as mine. One time he lost possibly every hog he had, and all that there was between us on this stream was about fifty rods of a pasture field that his hogs were not on, before it reached my field. My hogs were in my field all the time, and I never had one sick.

Another instance. This stream here may be termed a dry weather stream; this neighbor here has lost hogs once or twice. He lost nearly every hog he had: I lost none. Again, the only time I ever lost hogs, his hogs died, all fall. He never buried any of the carcasses; they laid around over the farm, and some got on my farm, and after his had been sick about three months, I lost a number of mine.

In the feeding of my swine I have to buy a great deal of feed. I don't grow enough on my farm for the hogs. I buy a good deal of mill feed, bran and middlings. Now, you very well know, that bone and muscle are to be found to a large extent in these two feeds. If I can feed them with corn and get it in the right proportion,

then I may expect my animals to be healthy, and if they are perfectly healthy, they are less liable to disease.

I want you to understand, gentleman, that in this talk I do not claim any hog is cholera proof; that I can breed a hog cholera proof, or grow one that is cholera proof. But I do believe that by attending and feeding them properly, I very much reduce the risk from disease. I feed in the morning, when only feeding once a day. I throw some feed in the flat bottom trough, with sides about five inches high, and six feet long. I make the troughs that length because they are easily leveled on the ground. I put what slop there is at the house, over the feed. The hogs are shut out until I have it ready. If I haven't enough slop to wet the feed, I pump from the well that is in this lot here, and pour over the feed.

I used to carry slop in the buckets until I nearly broke my back. I would lie in the house for two or three days, could not get up or down, for the reason that I carried slop buckets that were too heavy. I believed in slopping, *slopping*, SLOPPING. I would put in the barrel in the lot here, say a bushel and a half of mill feed, and fill the barrel with water, let it stand over night, dip it out for the hogs and let them in. I have slopped them that way and they would drink so much it was a burden for them to get out of the lot, and I have thought in that way that I gave hogs, that weighed from fifty to sixty pounds, the thumps. One spring I didn't have a barrel convenient, so while I was finding a barrel I put the dry feed into the trough, poured a little water and slop over it and found that it took about as much water as it did feed to wet it and make a stiff feed of it. I also found that my pigs did just as well when I fed it fresh, as when it had stood for twelve hours. It saved putting the feed through the barrel, one handling; and it saved me breaking my back. Since that I have never had a slop barrel about my feed lot. Some men will tell you to case up a barrel with sawdust, and put a cover over it, that you may keep the slop warm for your hogs. I notice the hogs in the summer time like to go to the spring and get a good, cool drink, and in the winter time when the mercury is down to zero, I go to the well where the water stands about 52° and it tastes pleasant, and it is the same way with the hog. One thing is certain, if you pump water out of the well and pour over the feed directly, and the hogs drink it, they have slop of the same temperature every day. And if I put it through a barrel, the probabilities are that one day it will be nearly at the freezing point, and the next day because I think it is a little too cold, I pour in a little boiling water, and I have it too hot. So I have adopted this plan in the winter and summer, I pump directly from the well and pour it on the feed. By a thermometer test, I find that it stands 19° above freezing, and that is not an unpleasant drink for the hogs at any time of the year. Now we all know in growing hogs, especially at the present time, at the low prices of hogs, that the less labor we attach to that hog, the more profit we get on him, when he goes to market. I have been studying and trying in some way to cut down the labor bill, connected with the growing of my hogs. The slop mixed in the trough is one way. You find eastern men, writing on this subject, say that the grain put through hogs should be ground, that there is more in it. Recent tests show that there is little more in it, scarcely more than you give to the miller if you take your corn to the mill and have it ground. If this is a fact, why not use this toll, or what you give to the miller, why not keep it on your farm and save the burden of going to mill? If I can get the hog to grind the grain properly, without going to the mill, then I have gained a point in the right direction. How shall we do this? Last fall when I fed corn, say this field (indicating) for instance, I could feed the corn from the field on two sides. I fed the pumpkins from here, and from there, and here, and there (indicating). Well, when my hogs went on this clover field, the year before last, I got a poor stand on it. Last spring I resowed and got an excellent stand, cut over the field twice to destroy the rag weed. By the time I came to want to feed corn to the

hogs, this clover was about eight inches high, as fine a stand as you ever saw. By letting the hogs have a few pumpkins first, and what grass they wanted, then feeding them corn I got a better digestion of the corn. Now, the only way you can know this, is by observation. A neighbor had a few shoats that he was feeding corn, and that ran over a clover field. Their principal feed was corn. As I passed through his feed lot one day, as a matter of curiosity I noticed the droppings, and pressed my foot on them, the corn looked more like corn that had gone through an ordinary corn crusher, than through a hog after proper mastication. In making the same observation in my own field, I found that such was not the fact. I found but little corn showing in the droppings. Now, if I can get corn consumed in that way without taking it to the mill, I save the toll, and save the labor and get a better return from the corn and hogs.

Another point, gentlemen, if we would grow hogs, we must keep up our land. I can remember old men speaking of a field near my place, a bottom field on the north fork of Paint, that they said for sixty successive years was in corn. The hogs consumed that corn by "hogging it down." It was not perceptible to the owner, that the land decreased in fertility. But the day has gone by when it seems possible for us to hog corn. Corn land is beginning to wear out. I can remember an old neighbor of mine, fed his hogs for thirty years on the same point on the hillside, near the branch; all the feed that was fed on that point for thirty years washed away to enrich somebody else's land. Now, if we can keep all this upon the farm to enrich our own land, we have gained a point in hog feeding in that direction. Now, for instance, say I buy a great deal of mill feed and feed it in a lot at the barn or near the house. If I feed my hogs here when they leave the lot in the evening or morning, they are full. They always pass over the pasture fields to get to the water. Now, you see, if the stream of water ran by the barn, here, the possibility is that in warm weather they would never go to the lower end of the field. I have a neighbor who has a stream within a few rods of his barn. People come along and say "What a fine thing for you to have your stream right close to the barn!" He says I would give two hundred dollars if that stream were on the opposite part of my farm, because everything is washed away. In the morning after my hogs are fed, they go down over the pasture field to water, and as they go will leave their droppings on the field.

Another matter and I am done—in reference to how I feed the grain to have it clean. In this field I fed my hogs this year until November. During that time they went to the barn for shelter, if the weather was bad. I have houses six feet square that will accommodate five hogs each, weighing 250 pounds, and by moving a number of them into the pasture field and putting them on high ground, I can comfortably shelter all my hogs. This fall I fed corn along this fence. I feed here until it gets a little dirty, and then I change, and maybe feed a week along this line of fence, always having a clean place to feed, with the basket, and if it gets a little dirty, I carry it out into the clover.

Now, in reference to slopping, I would say that I have found straw thrown around the place where I slop, is better than the mud. They work but little of it into the troughs, and I turn the troughs up side down when they are done, and it keeps the snow and straw out. During the winter I can slop my pigs that way, and keep them clean, without having a feeding floor. If I had a feeding floor, I would of necessity have to move it around from one field to another.

Another thing in reference to the use of straw. I have known men to burn their straw piles to keep their hogs from lying around them. It is easy to shelter a hog by a straw pile and give him a good shelter. It is better to feed him about a straw pile than to feed him in the mud.

President Lazenby: Perhaps there are some questions you would like to ask Mr. Jamison, if there are, I think he will be glad to answer. We can devote a few moments to the discussion of this matter.

Mr. Scott: The gentleman referred to the feeding of pumpkins. I would like to ask him whether he derived a profit from the feeding of pumpkins directly, or whether it was only a benefit to digestion when fed in connection with corn?

Mr. Jamison: The way I feel about it is, that I got much more profit by feeding the pumpkins with the corn, than I would from feeding the corn alone. There is more in it to me for two or three reasons. While there is not so much in the pumpkins it seems to keep up the health and the hogs enjoy and relish pumpkins each day, and for that reason I like to have them.

Mr. Scott: Then there is another question. We now have to compete with inspectors, and the farmers must get their crops in the best possible shape to meet the market, and I believe the feeding of pumpkins is detrimental to the quality of the pork; it has a tendency to make it soft and juicy, and not solid.

Mr. Jamison: I do not think so. The hogs that I grow are always considered by the shippers the best they get in the neighborhood, always get out in good shape, plump, and well rounded up and with very little drift, to Baltimore. Sometimes they have told me that they didn't drift more than five pounds to the head in going from my place to Baltimore, and I have no trouble in getting the very top figure for them. Understand me, I would not undertake to make pork out of pumpkins alone.

Mr. Newton Rector: I would like to ask the gentleman whether he wires his hogs or not?

Mr. Jamison: That is a point I might have talked upon, but as you ask for it, I will tell you my plan. Now, in this feeding of a mixed ration, I honestly believe that if men would follow that, they would have but little trouble with their hogs' rooting. Two winters ago I kept thirty-five head on this twelve-acre lot of land, here, clover sod, that fronts the roadway on the north, and people passing that field remarked "How little those hogs root!" Last year I had forty head on another twelve-acre field, and buyers coming to look at the hogs, would say, "Your hogs don't root at all, hardly." I will venture, that on that twelve-acre field, three years ago this winter, and the hogs running there all winter, there wasn't a half acre of that land stirred. Now, understand me, gentlemen, if I had had those hogs on blue grass pasture, or timothy sod filled with all sorts of worms, the probabilities are that they would have turned it clean. The clover sod they hardly ever root. They root up the blue grass around the fence corners or stumps, but clover they root very little. I never ring spring pigs. They go to market in November or December or earlier without a ring. This last

spring, the time my hogs passed into my permanent pasture for water, I noticed that they were beginning to root a little, probably hunting for worms; they turned up perhaps half an acre.

Another thing: I let the fall pigs—I have thirty of them that weigh from thirty to eighty pounds—have the privilege of this north-west field. I have a nice growth of wheat over it, and when I gather the corn where the corn dropped on the ground, there was a good deal of shelled corn, and within the last three weeks they have been out there to gather up that corn, and they have not rooted up a spear of wheat. And probably those fall pigs will go to market next May or June, without ever having seen a ring. But the brood sows that run over the permanent pasture, I ring, to keep them from tearing up the sod.

The President: We have an institution in which every member of of this Institute, in fact every citizen of the state, every tax payer, is interested; this is our Ohio State University; and I am very glad to be able to announce that the next paper upon the program is "Agricultural Training at the Ohio State University," by my colleague, Professor Thomas F. Hunt, dean of the agricultural college and of domestic science.

AGRICULTURAL TRAINING AT THE OHIO STATE UNIVERSITY.

BY PROF. THOS. F. HUNT.

I feel a great hesitation in discussing this subject. If anything good can be said of the agricultural training of the Ohio State University it would be much more pleasing to have it said by some one else than by those who are in a measure responsible for the conditions which exist. I am aware that my hesitation is ill conceived.

The University does not belong to the officers and instructors therein, except so far as they are citizens and taxpayers. The University belongs to the state. The University is yours. The officers and instructors of the University are your employees. We are, in the language of our president, your hired men. You have a right to ask for an account of our doings. When, therefore, the worthy Secretary of Agriculture insisted upon my presenting this subject at this time, I could not well refuse.

If you pay taxes you are interested in the University because your money is used to support the institution. The University now enjoys an income of about one-fourth of a million dollars annually, and while this is a tax of only about six cents per capita, yet in the aggregate this large sum may become an engine for great good or great evil. It is the interest of every citizen to know that the sum is judiciously expended, although he may feel but little interest in his own individual contribution. A man who pays taxes on a valuation of twenty-five hundred dollars contributes twenty-five cents annually to the University. But this is decidedly the lesser interest which every citizen should feel in the University. Every citizen who is interested in the youth of the state should be profoundly interested in the welfare of the University. Every parent who has a child to educate is doubly interested in the welfare of the University whether that child ever gets to the University or not, because the University is but a part of the educational system which extends to every primary school in every hamlet and district of the state.

The University was founded in accordance with the land grant act of 1862. This act states that "The leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the several states shall respectively prescribe in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

It may be well to observe here that the purpose of this act is to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. This act does not require the teaching of agriculture and the mechanic arts as such, but requires the teaching of such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes.

The endowment under the land grant act of 1862 and the subsequent grant of military lands in 1871, amounts to thirty three thousand dollars.

The University was established in 1870 at Columbus, and was secured by the citizens of Franklin county by offering three hundred thousand dollars for its location. This money secured the farm which now contains three hundred and forty-five acres and built the main building. The total appropriations by the state from 1870 to 1890, or during the first twenty years, was three hundred and fifty thousand dollars. In 1890 the so-called second Morrill act was passed by the national congress appropriating fifteen thousand dollars for the first year and an additional sum of one thousand dollars each year until twenty-five thousand dollars was reached. The University received twenty-one thousand dollars last year under this act. This money is "to be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical and natural and economic sciences, with special reference to their application to the industries of life and to the facilities for such instruction." In 1891 the state recognized the University as a part of the public school system by amending the law relating to public schools in such a manner as to give one-twentieth of a mill on the tax duplicate to the University. These two acts caused a very large development of the University. In 1891 when the first "Hysell bill" was passed, the University employed thirty-eight instructors and had four hundred and ninety-three students, over one-third of which were preparatory students. In 1896 the University employed seventy-two instructors, not counting instructors in the College of Law, of which there were nine, and had nine hundred and sixty-eight students, about one-fifteenth of which were preparatory students. In 1891 there were thirty-one students in the courses in agriculture; in 1896 there were eighty-three.

As a result of the "Hysell act" of 1891, the geological building, known as Orton Hall and the manual training building known as Hayes Hall, at a combined cost of one hundred and fifty thousand dollars were erected. The University has now over eighty instructors and thirty three departments of study, offers twenty-five distinct courses, all but one of which require two or more years for their completion, and has nine large buildings devoted to instruction. The lands, buildings and equipment are estimated to be worth over two million dollars, although the total appropriations from all sources during the twenty-six years of the University's existence has been less than this sum. Senator Hysell introduced into the last legislature a bill increasing the tax from one-twentieth to one-tenth of a mill. The University will hereafter receive one hundred and seventy thousand dollars from the state, making its total income about two hundred and fifty thousand dollars. At the same time Senator Williams introduced a bill allowing the University to issue bonds in anticipation of this levy. With a portion of this money the Board of Trustees is building three new and much needed buildings on the University campus; an agricultural building at a cost of about seventy-five thousand dollars which will bear the name

of the late Dr. N. S. Townshend as a memorial to his public service and his work in advancing the cause of agricultural education; an armory gymnasium at a cost of sixty thousand dollars; and a biological building at a cost of thirty thousand dollars.

The income and the expenses of the University for the year 1896 were one hundred and seventy-five thousand dollars. Fifty-five thousand dollars was received through acts of the general government, about ninety thousand dollars through acts of the state government, twenty-two thousand dollars from fees, and the balance from minor sources. In addition, upwards of twenty thousand dollars was given by Emerson McMillen and other public spirited men. Of the twenty-two thousand dollars paid in fees by students, something over five thousand dollars was paid in fees by one hundred law students. The remaining students, a little less than nine hundred, paid seventeen thousand dollars in fees. In other words, for every dollar that the student or his parent or guardian paid for instruction at the University, the state expended upon the student ten dollars. Is it not a good business proposition for one who has a child to educate to send him to a University where ten dollars will be expended upon his education for every dollar he gives in return?

Aside from the Law School, which is nearly self supporting, the state is expending on the education of its sons and daughters at the Ohio State University nearly two hundred dollars per capita, but the student is getting far more than two hundred dollars, worth of instruction. There are twelve hundred hours of instruction given at the University each year, each student pursues on the average about fifty hours, he thus takes one twenty-fourth of all the instruction given which costs the state over seven thousand dollars. While the average fee to the student is about twenty dollars per year, the Board of Trustees offers two free scholarships from each county in the state. These scholarships are good for the two years' course in agriculture and cover all fixed dues.

There are two classes in this state. One class thinks that the University teaches no agriculture, the other class thinks that the University teaches nothing but agriculture. Both classes are mistaken. While it may be immodest for me to say so, the University teaches a great deal of agriculture; in this respect it compares favorably with any other institution in the country; but while it teaches much agriculture it also teaches much of many other things.

The Ohio State University is divided into six colleges as follows:

- College of Agriculture,
- College of Arts, Philosophy and Science.
- College of Engineering,
- College of Law,
- College of Pharmacy,
- College of Veterinary Medicine.

Each of the above named colleges is under the direction of its own faculty, which has power to act in all matters pertaining to the work of the students in that particular college.

The College of Agriculture offers six distinct courses of study:

1. A four years' course in Agriculture,
2. A four years' course in Horticulture and Forestry,
3. A four years' course in Domestic Science,
4. A two years' course in Agriculture and Horticulture
5. A two years' course in Domestic Science,
6. A special one term course in Dairying.

The four-year courses of the College of Agriculture are courses of higher education in just exactly the same sense as the so called classical course is a course of higher education.

The land grant act of 1862 required that there should be established a college, not a school. The four years' course in agriculture not only gives instruction in

agriculture, but in such branches of learning as relate to agriculture and that will promote the liberal and practical education of those who devote themselves to farming. For example, the four years' course in agriculture consists of about one-third technical agriculture, one-third science, and one-third English and other languages, philosophy, history, and economic science. The facilities for instruction in science are elaborate and thorough, and the instruction in languages, philosophy, history and economic science is given by men who have devoted their lives to the study of these particular branches. But of what does this technical agriculture consist, which occupies one-third of the student's time in a four-years' course, and about one-half of the student's time in a two-year's course? A student returned from his thanksgiving vacation said to me, "When I go home people ask me what I am studying, I tell them I am studying agriculture. They reply, 'You are studying agriculture? What's that? What do you study?'"

It is impossible in a paper of this character to state fully of what technical agriculture consists; I can only give examples. The student studies the soil; is taught to analyze the soil; he studies its physical properties and finds the number and size of the grains in the soil. He finds from this study that the exterior surfaces of a cubic foot of soil may equal three acres and that soils differ largely in this particular and the power of crop production depends in a measure upon this fact. He finds for himself from actual trial that an important difference between the rock and the soil is the fact that the rock is solid and that one-half of the space in the soil may be unoccupied by soil particles. The student is taught the use of fertilizers and how to calculate their value; is taught the manner and methods of drainage and irrigation and of tillage and effect and use of various farm implements upon such processes. The history, use, and culture, climate and soil adaptation, harvesting and marketing various varieties of farm crops are carefully studied. Kinds, care and management of live stock are taught. The student is taught the characters that each class of animals should possess for special purposes, and by means of score cards students are taught to judge the various classes of live stock; as an illustration of what may be done in this line, thirty students of the University judged six cows from the herd of a leading showman in this state. After the students were through, he stated to me that he would sooner risk his cattle in the hands of those students than in the hands of any of the judges at the eight county fairs at which he showed his cattle this season; yet most of these students had but two lessons in judging this particular class of animals, in addition to a couple of lectures upon the subject. The student is taught the principles of breeding and mating animals and is taught to understand and properly interpret pedigrees. He is taught the principles of feeding and how to calculate feeding rations which will bring the best results with the foods at hand and for the purpose used. Butter and cheese making, and testing and pasteurizing milk is most thoroughly taught with ample facilities and expert instructors. Three thousand feet of floor space is already devoted to the machinery and apparatus for this purpose, and Townshend Hall, which will be ready for use next year, will contain six thousand feet devoted to machinery and apparatus for instruction in butter and cheese making, testing and pasteurizing milk and the management and operation of boiler and engine. No handsomer suite of rooms can be found anywhere in America for this purpose than will be found in this building. Fruit raising and vegetable growing and greenhouse work are thoroughly taught. In addition to the large gardens, lettuce, radishes and tomatoes and other vegetables are raised by sub-irrigation, under glass. Grafting, budding, cross fertilizing, trimming and other technical work of the horticulturist, the student is taught to do. Both forestry and floriculture are given special study. Diseases of animals, diseases of plants, insect enemies and insect friends receive proper attention, and methods of treating diseases and combating insect enemies by spraying and otherwise, are amply taught. The skill which students acquire in

the forge shop and in the carpenter shop working but six hours per week for ten weeks, is truly remarkable. But these things must be seen to be fully understood. I will not tire you by giving more examples, but suggest that you take this opportunity to visit the University and see for yourselves the work that it is doing.

Few men are content to buy a driving horse or even a bunch of swine without seeing them, but many seem content to send their sons and daughters to a university or college which they have never seen.

The most important feature of an institution of learning is its students. The finest saw mill in the world may be running and making a great noise without sawing any logs. Sometimes machinery makes more noise when it is running empty than when it is at work. A saw mill that has no logs to saw would not be a success. A university must have logs to work into finished material or it is not a university.

The College of Agriculture of the University last year contained eighty-three students, of these thirty-eight were in the four-year courses and thirty-four in the short courses. During the year five students were appointed to positions in colleges and experiment stations; five were employed in creameries, cheese factories, or dairies; a larger number engaged in farming. In this connection it may be well to state that while we do not have any system of compulsory student labor, a large part of the work of the University farm is done by students. The farm pay roll for the year 1895, the last which we have summarized, shows that eighty-nine students received employment during the whole year, which includes the vacation months.

One student, Mr. Imes, earned	\$300.
Four students earned between	\$200 and \$300.
Five "	100 and 200.
Twelve "	50 and 100.
Eight "	25 and 50.
Fifteen "	10 and 25.

The total amount paid to eighty-nine students was three thousand eight hundred fifty-eight dollars and seventy-seven cents; in addition to this there was paid eight hundred seventy-seven dollars and ninety-two cents to students for work on the campus. These figures do not include the amount paid to students in the horticultural department, or in the other departments of the university, which in the aggregate is considerable.

In closing, I wish to state briefly that the courses in the College of Agriculture as well as the other colleges of the university, recognize that the students should be taught both to do and to think. In the language of President White, of Alabama, "in handcraft and in readcraft." We recognize that the students coming to us, as they do, from the farms have had better training in handcraft than they have in readcraft; they have been taught to do more thoroughly than they have been taught to think. I believe that the students, who come to us to study agriculture, having been already more thoroughly trained in doing than in thinking, it is our duty to lay special emphasis upon thinking, while not neglecting the other important educational factor, the doing. The courses in agriculture are also based upon the fact, that most of our students, who take this course, have been reared upon the farm; these courses are not designed to take the place of education upon the farm, but to supplement it. These courses of study do not give the student, who lives in the city and knows nothing of farming, sufficient instruction to make him a successful farmer. Such a course might be devised, but to do so would be to waste a portion of the valuable time of nine-tenths of the students who come to us for instruction.

The President: We have now a few minutes for discussion, or if there are any questions you would like to ask Professor Hunt I am sure he would be only too willing to answer them.

Mr M. I. Todd: I am quite interested in this school, because I have a boy, and I want to ask this question. It is a life question to-day, and that is this: Does this institution allow hazing? I would not want to send a boy into any institution in this country that looks on hazing with any degree of complacency, and I shall never send a boy into an institution that allows hazing, and where the students take charge at times of the institution.

Professor Hunt: I have been connected with the University five years, the first of January, and so far as I know, personally, I cannot recollect of any case of hazing at the University during my connection with it. There are other members of the faculty who may have a better recollection of it. The chairman of this convention has been connected with it a great many more years, and perhaps he could tell you better than I can.

Senator Chas. M. Hogg: What proportion of the boys remain on the farm after they come out of the college? Have you any means of knowing?

Professor Hunt: So far as the students who have gone out of the agricultural classes are concerned, take those who have graduated, there have been only two or three that have not gone into work either on the farm or some position directly connected with agriculture. A large proportion of them, say perhaps just about half of them, or a little more, are connected with agricultural colleges or experiment stations. I am speaking of graduates; the larger portion of those who take the two years' course return directly to the farm. I cannot give you the statistics, but a larger proportion than the gentleman's question would indicate.

Mr. Newton Rector: I am not personally interested in the University here, but I may be in another year, because I have a son I expect to send here, perhaps, and I want to ask the Professor if he thinks that football is conducive to health, college football? Generally there are more students injured in playing football than in hazing. The whole number of casualties during thanksgiving day was forty injured and about eight killed in the games of football. I think that it is so brutal that every college ought to take steps to stop it. (Laughter and applause.)

The President: I want to say this, if the Professor will allow me: It will be impossible for us to enter into all of the foreign subjects pertaining to college discipline and college athletics, but let the Professor answer this question.

Professor Hunt: I would like to say one thing in regard to this. I believe there is a gentleman in the audience who has played football for five years and he seems to be in good health. I can say personally I do not believe in intercollegiate athletics, or intercollegiate exercises of any kind. I do believe in football on our own grounds and among our-

selves; personally I am opposed to intercollegiate games. I have never said this publicly before, but I am just as much in favor of football as any other forms of athletics.

A Gentleman: They don't have to play. (Laughter.)

Professor Hunt: Oh, no, they don't have to play.

The President: We have another public institution in which we are all quite interested as citizens, and especially as taxpayers, that is our experiment station, and our next subject will be an address upon "Alfalfa, Crimson Clover, Rape and Other Forage Crops," by Professor J. Fremont Hickman, of Wooster, Ohio.

Professor Hickman: Mr. President and Gentlemen of the Convention, I found, after attempting to write upon this subject, that I had taken too broad a one, including in that subject too many topics. I found when I came to look over the series of forage crops that might be grown and in which you are all more or less interested, that I could count about fifteen or twenty, and in the subject you will find I have mentioned but three, three of the main forage crops. There is a reason for bringing this subject before you at this time from the very fact that we are growing more stock, and from the fact that we are finding more pests with which to contend, and we find a necessity of using forage crops in soiling.

ALFALFA, CRIMSON CLOVER, RAPE AND OTHER FORAGE CROPS.

By PROF. J. FREMONT HICKMAN.

A growing and constant interest in forage crops suggested to the Experiment Station the advisability of undertaking to gather by practical methods some information concerning the numerous new and untried but highly recommended forage crops. As early as 1889 our first efforts were put forth in this direction, and the first test was with alfalfa or lucerne, and for this reason we take up first, as indicated by our subject, alfalfa. We often hear the question "What is in a name," and if this question be asked of an individual or being that has but one name what shall we say of a plant that has two names? Answer, it should have but one, but we find in this instance that the name alfalfa was given by the Spanish and the name lucerne by the French. Previous to this the plant had been given the name medica or medica by the Greeks and Romans, because it had been brought from Media at the time of the Persian war.

This plant belongs botanically to the same family as the clovers, peas, beans, vetches, etc. It was introduced into Mexico from Spain, thence into South America, and from Chili into California, and later into Colorado and Kansas, thence eastward across the continent until it has, within the last decade, reached the eastern shores of North America.

To the arid regions of the western states it has, without question, been one of the most valuable plants ever introduced. Alfalfa is to the arid regions of the west vastly more than the little red clover to the less fertile lands of the middle and eastern states. The attentive hearer and the careful reader has already begun to draw the conclusion that I cannot recommend alfalfa as generously for Ohio as I can the little red clover, or even the greater red clover. Were I not living in an

age of reason, I might stop here and allow the mere statement to stand, but having made the assertion the interested reader demands the explanation.

Experience teaches that every plant grown has its peculiarities, and that every one grows somewhere to perfection, and on the other hand the same teacher instructs us that plants do not succeed everywhere.

This is as true of alfalfa as it is true of any other plant. This special leguminous plant prefers a light sandy or loamy soil, and a subsoil through which its long roots can readily penetrate. Soils underlaid with a shale or hardpan are not conducive to its successful growth for the reason that the roots must penetrate the subsoil until they find moisture and find it in abundance. While this plant prefers light and porous soils, it is not necessarily restricted to them, for it has been grown on clay giving good results, though this is the exception rather than the rule. The greatest difficulty with it in our experiments has been to get a stand. In this we have succeeded three years out of eight, but in none of these three has the alfalfa given sufficient growth to warrant either cutting or pasturing the first year. When I say that I have dug up roots of only five months growth measuring fifty-five inches in length, the statement that, after once started, the nature of the subsoil is of vastly more importance than the surface, will not need further argument or evidence. To my own knowledge these roots have been found running to a depth of eight and even nine feet into the subsoil. When once established in the soil the trouble is over, and it is one of the most tenacious of the leguminous family of plants; enduring more dry weather, more heat, and perhaps more cold than any other forage plant, it seems to defy the hottest sun, the driest soils and the widest variation of temperature. Our best results in starting alfalfa has followed early and deep plowing (in the spring) thoroughly pulverized surface, and the seed sown broadcast at the rate of twenty or twenty-five pounds per acre, and oats sown with it at the rate of one bushel per acre, all harrowed lightly, covering the seed very shallow. Twelve or fifteen pounds of good seed per acre would be an abundance. But in our experience we have found from forty to fifty per cent. of the seed did not germinate.

The seed is somewhat larger than the seed of common red clover. When fresh and good it should be glossy, yellow and heavy. It may be further noted that if the seed appears white it is an indication that it was not mature when cut, and it is, therefore, uncertain whether it will grow or not.

The great difficulty in getting the plant to start, and the slow growth of the first year precludes it from coming into any short rotation. We cannot expect anything from it the first year. The second year it may be cut not less than twice or more than three times. It will be of a stronger growth the third and fourth years if not pastured, but will probably not improve any after the fourth season, though it may be continued almost indefinitely upon the same ground.

Most writers speak of it as making excellent pasture. If that were the only point to be considered, I could heartily agree with that opinion, but if we take into consideration the after welfare of our alfalfa field we will hesitate before turning stock upon it at all. The objection to pasturing is the detrimental effect upon the plants. We have already observed that the alfalfa may be cut two or three times in a single season, and it necessarily follows that it must be a rapid grower, and in general we say that rapid growth is apt to be a tender growth. This is strictly true of the plant with which we are dealing. After cutting or feeding off, the young shoots start out much sooner and grow very much more rapidly than in the common clovers, and are correspondingly more tender. When stock of any kind are pastured upon it they do much harm by breaking off these tender shoots.

To get the most out of alfalfa it should be cut and fed green or cured for hay, and it is in the best condition for cutting for hay when it begins to blossom. If left much longer the stems become woody and less digestible. When used green,

either as a pasture or as a summer feed, it should not be fed without wilting nor pastured while wet as there is danger of bloating. From the best evidence I am able to gather, I have reason to believe that in this respect it is more dangerous than common clover. As hay it is relished by all farm animals. Any animal that will eat common clover will relish alfalfa, and in feeding its value is regarded as superior to the clover hay. From the experience of myself and others I believe that river and creek bottoms as well as other soils of a loose and porous nature will grow alfalfa profitably, but I cannot recommend it indiscriminately for Ohio soils, though I have no doubt but that it will do well in some sections and upon some soils, and when it does succeed it will give as good returns for the land occupied as any other crop that can be grown upon it.

Crimson clover, like alfalfa, is known under two or more names, namely, crimson, German and Italian clover, but has come to be known commonly throughout our own state as crimson clover, a name most applicable because it describes almost exactly the color of the blossom it bears.

For the past five or more years this clover has been pushed early, long and late by seedsmen and seed growers, who were within that section of country where crimson clover was a success. In some of the southern states and in Delaware and New Jersey, it has been grown with marked success, but north and west it is not conceded a success. At the Ohio Experiment Station we have tried to encourage this plant with the hope that it might furnish the much needed mulch on our stock ground during the winter season. We have sowed the seed at periods ranging from July 1st to September 15th in the hope of striking the proper season at which to seed. Then we have tried at different periods different methods of seeding, such as sowing the seed without stirring the ground, sowing after stirring and again cultivating, sowing and covering lightly. We have tried this on a small scale and on a large scale, including acres, and after five seasons of almost total failure we have not given it up but are trying again. In one instance we had a very fair stand in the fall and have at the present time, but in previous years a part of it stood very well until the month of March after which it was almost impossible to find on a ten-acre field as much as one could carry in one hand.

In the spring of 1895 crimson clover seed was sown with oats about the middle of May. From this seeding we had a very fair and the only stand of crimson clover in all our experiments with it. That particular piece headed out in September after growing to an average height of seven inches. The results from this early seeding from which we secured a fair stand indicates that crimson clover can be grown and matured within one season, while the results of other experiments go to show that the plant will not survive our northern winters.

From the results of our experiments, I have reason to believe that seeding in May or June is most likely to result in an early, rapid growth followed by premature blossoming and an early decay of plant life. Seeding in July will possibly give the plants sufficient strength to pass through our winters, but later seeding is almost sure to fail in this latitude except under the most favorable circumstances.

The seed is larger than the ordinary red clover and should be sown at the rate of ten to twelve pounds per acre. One-half of this amount would be ample if real good seed could be obtained, but thus far I have found the seed lacking in vitality. This clover is noted for its rapid growth, but bears a weak stock, nearly always assuming when in blossom a decumbent position. It is remarkable for its stooling qualities or habit and prolific flowering capacity. I have been able to count more than sixty stems from a single plant, and I believe they bear more than a third more blossoms than main stems; a part of these flowers coming from side branches of the main stems. After all that has been said regarding crimson clover in print and elsewhere, it has occurred to me that the season of the year usually recommended for sowing the seed is one out of all seasons and that it is no wonder if the

plant has failed. Reasoning from the standpoint of the ordinary season and conditions of our months of July and August, how could we expect crimson clover to grow? We would not expect anything else to make a start except possibly turnips. Is it not true that we think we are lucky if our plants, started and in good growing condition, pass through these, the most critical months of the year, without getting a backset?

I believe it would be quite as rational, perhaps even more so, to attempt to grow our own acclimated red clover. I am of the opinion that in favorable seasons we could grow a good stand, such as would pass through our winters. This article bears the earmarks of one weak point which I am not able to clear up to my own satisfaction, namely, it is claimed that our failures in growing crimson clover in this country are due to foreign seed which is regarded as inferior to the American grown seed.

We have made but a single test with the latter and that one was as much of a failure as any of the others. Let me say in concluding this paper on crimson clover that it is claimed for it that it is good for soiling, good as a green manure, good for hay, good for poor land, good for silage, good for pasture, etc. From the very nature of the plant these claims are certainly all correct, but of what value are all these good qualities unless we can grow the clover?

Rape, the third section of our topic, includes a plant that is not as widely known as a forage crop within our state. It belongs to the same family of plants as cabbage, mustard, turnips and rutabagas. In its early growth it resembles the turnip to a marked degree.

It may be planted or sown broadcast on well prepared ground almost any time after the first of May until the middle of July, and will in favorable seasons make considerable pasture when sown as late as the first of August, but makes its best growth when put in the ground after the ground has become thoroughly warm. The earliest seeding will make a slower growth but will make a larger yield per acre. There are several varieties of rape, but none recommended for our soil or climate that is superior to the dwarf 'Essex'. This can be had at the first class seed stores. From four to five pounds of seed when sown broadcast will be ample, and half that amount will plant an acre if it is drilled in rows thirty inches apart. This method is recommended more for the early than the later planting, for the reason that some cultivation may be necessary to keep the weeds down. This would apply also to ground that is more or less foul.

This plant has a specific place and is recommended as a sheep feed and can be used in two ways. First it may be cut and fed in the barns and is especially good for fixing up show sheep, for bringing up sheep that have gotten out of order, and may be fed in the same way to the general flock. But its wider use is as a pasture. For this purpose it is not often needed until July or August, sometimes not until the later fall months. It is a good plan to plant some (if possible) early in May, and to plant every two or three weeks after that until the first of August, would, under ordinary circumstances, furnish good pasture throughout the season. When the rape has gotten two or three feet high, the sheep may be turned into it, but the precaution should be taken, if possible, to have them run into an old pasture field that joins the rape patch, for the rape alone will not likely agree with them. While they are not likely to eat too much the first few days, there is danger after they get to eating it that they may overload while it is wet, which may result in indigestion, or bloating, and in some instances purging may be a result. The dry pasture even if not very plenty will correct in most cases all these difficulties. If the first few days are passed without trouble, there will be but little if any danger after that, but it will always be judicious to look after them frequently.

During the past summer we turned our lambs after weaning, into a field that had been mowed and on which there was plenty of pasture until after the first of

October. In one corner of this field we had planted a rape patch early in May; at the time of turning these lambs into the field the first of August, it was in good condition for them to work on, but on account of the seasonable rains and abundant pasture they ate but little rape until the pasture grew short, after which they commenced eating it gradually and during the month of November they almost lived in the rape patch, and during that month gained more in live weight than in any previous month. On the first day of December, when they were put into the barn for the winter, not a vestige remained of the rape, except perhaps four or five inches of the stalks of each plant sticking out of the ground.

When this plant is eaten or cut off it starts a new growth almost immediately, and continues to grow until after freezing weather sets in. Frosts alone do not kill it, it will stand several degrees of freezing without being injured. If however, sheep are pastured on it and break off the branches while it is frozen, it results in a permanent injury to the plant.

We find two objections to the rape plant, the first, about which there is no doubt, is its liability to an attack from the cabbage aphid. This little pest is capable of destroying a whole field within a very few days.

The second objection is as yet only an apparent one, namely, that in one particular instance there was every appearance of a rapid depletion of the soil. This was shown in a most striking manner on the crop following the rape, but further proof of the fact remains to be brought out.

From our experiment with the crop I am clearly of the opinion that it is worthy of a fair trial, and may prove to be a forage crop of more than passing value, especially to the sheep breeder.

The fourth division of our subject "Other forage plants," includes a score or more of plants. Some of considerable importance and others that it will scarcely seem worth while to mention. The entire list of which we intended to speak, includes the following: cow peas, soja beans, Canada peas, vetches (both winter and spring varieties), flat peas, sweet clover. All of the above belong to the leguminous family. Then we have the following, belonging to the graminaceæ family: corn, Kaffir corn, Millo maize, Jerusalem corn, teosinte and different varieties of millet. Then there are still others that must go unnoticed, such as saccharum and purry and finally the greatest of them all, maize or Indian corn.

One of the most recent of these forage crops brought to our notice is the soja bean. This is a Japanese plant belonging to the same family as our clovers. We have grown it at the Station for three years with marked success. It is an annual plant and matures seed in our climate when cultivated, as corn, and can be planted in about the same way except that it can be grown much closer together. The crop can be used as a feed in its immature state, or can possibly be used with more profit to plow under, the same as clover. If its effects should be only half as good as the use of clover plowed under, it would still be a more valuable crop for that purpose for the reason that it requires but a single season to grow the crop. If the seed is not an object it can be sown broadcast in May after all danger of frost is passed and on very moderate soil. It will by the first of September make about as much green manure as can be plowed under to advantage. One bushel of seed per acre should give a good stand, and it can be put in with a grain drill or sown broadcast and harrowed in, covering lightly.

The crop can also be used as a substitute for hay, though it is not as good for this purpose as many other plants of the same family. It is more difficult to cure, does not keep so well and sheds its leaves more easily than the clover when dry. From my present knowledge of this plant I regard it as one of the most promising new plants either as a forage crop or for plowing under.

Cow peas. After two years' experience with cow peas on our clay soils of northern Ohio, we are not justified in recommending them. They may do better further south, and doubtless do, as that is their native heath.

The flat pea (*Lathyrus Sylvestris*). After three years' experience I have about concluded that it is a flat failure. The greatest obstacle to its general introduction is its slow growth; we find that it takes about three years to get it well started. The average American farmer cannot afford to wait nearly so long and consequently will discard it for better things. Time and patience will not permit a further discussion at this time, and I hasten to make mention of Ohio's greatest forage crop, a plant with which every one is familiar and needs no introduction how to grow or how to harvest,—for with a good silo and equipment with which to fill it, then with the corn crop and well cured fodder we will find our most economical forage crop. The one that will give us the most tons per acre and most good, reliable feed is that good, old crop, corn, the alpha and omega of all forage crops.

The President: Gentlemen, this paper is now open for discussion, and, as there will not be time for another paper before adjournment, we can devote some little time to the discussion of this paper. I know that Professor Hickman will be ready to answer any questions, or if there is anyone who has had experience, if he will relate it briefly, we will be glad to hear it.

Mr. John McGuire, Knox: I would like to ask the Professor if the rape plant is ever harvested and preserved for winter feed?

Professor Hickman: It is impossible to keep the rape for winter feeding. It is too much like cabbage. We have experimented with it in the silo but it is not a success. The odor is one that is ten hundred times worse than ensilage odor.

Mr. George Gill: I would like to inquire as to the comparative food value between alfalfa and the common red clover.

Professor Hickman: As stated in the paper, while not exact but in general terms, the alfalfa is a better feed than the clover, it is only seldom higher in the proportion of protein matter, probably amounting to some five per cent., the other elements being practically the same. But it has a higher value than the red clover, slightly.

Mr. M. I. Todd: I have seeded to alfalfa a little, myself, but it is not, I think, a plant that is generally successful over the state of Ohio, and I think there will be some money lost on this plant, and for that reason I believe we ought to be careful. The trouble with the American farmers is the *rush* that there is in them. They are like a flock of sheep; they chase the bell wether, it don't make any difference if he goes over the precipice, they follow, and we are liable in this alfalfa business to get too much of it. Now, of course, it has been shown here that it is worthy of culture, that it can be raised. But I rise to illustrate what has been tried in Michigan. In the experiment station in Michigan, we saw in the Ohio Farmer recently, that an experiment had been made with one hundred lambs, and a good body of lambs too. In that experiment there were ten lots of lambs and one was fed on alfalfa hay, corn and roots, and the statement was made in the Ohio Farmer that the most gain was made on this lot. That was true, but when you come to the pocket book, which is the American farmer's interest more than anything

else, we find a very different thing in regard to alfalfa. In the experiment with ten lots of lambs, ten in a lot, we find that those fed alfalfa stood only third, while there were seven other lots that beat it (the speaker evidently said what he did not mean). So, gentlemen, do not suppose for a moment that you are making the most money by putting on lots of flesh. There was more money in the pocket books from seven other feeds, and clover and cornstalks were against it; cornstalks and roots and corn giving the best results, financially.

Mr. John McGuire, Knox: I would like to ask the Professor, if he has had experience with shredding and cutting fodder, or both, which he likes the better?

Professor Hickman: I am not ready to answer that question today, for the reason that we are beginning an experiment with two machines. We propose to feed our herd of forty head of cattle with shredded fodder for a few weeks and then turn them over to cut fodder and see which way they will take the most of it. I have not an opinion to offer today for the reason that I do not know.

The President: If there is anyone present who has had experience with crimson clover, I am quite sure many of us would be glad to hear about it. It is a crop I am interested in, from a horticultural standpoint, because I have looked forward to it as being a valuable cover crop, a crop to sow on our orchards or berry plantations. Now, if anyone has had successful experience with crimson clover I should be very glad to hear from him.

Mr. S. H. Todd: When I was attending an institute in northern Indiana this year, I was asked to go out and view a field of crimson clover; it was about one-half or three-quarters of a mile north of Butler, Indiana. I forget the man's name, but that field he sowed to crimson clover in August this last year, sowed it in his corn and used a harrow that he fixed himself for the purpose of harrowing it in. Now, it was one of the grandest sights I ever saw, and I said if I could only raise a crimson clover crop like that I should feel as though salvation had come to me. (Laughter). It was as thick as a mat. It was like walking on a carpet, and it was as green as any foliage in the spring of the year. This was after we had had a spell of cold weather, and I am told that it stood that high (indicating about twelve inches). Now, there were thirty-three acres of that and he told me he had good success the year before, but he didn't get as good a stand. He said the year before he had gotten sixteen and one-half bushels of seed from an acre and three-fourths. Now, he seemed to be strong in the faith that if we could get the seed raised in the locality where we wanted to sow it, or about in that latitude, we might have the same result. He attributed a great deal to that. He said he didn't have success until he grew his own seed.

I give this as a result that I have seen, and I know that every farmer here would enjoy his dinner better if he could see that clover.

Mr. A. W. Livingston, Franklin: We have had a good deal of experience in the sale of this crimson clover seed, and it is very strange to me if men would be successful in growing it. They commence in June and quit just about the time the ground freezes, in buying the seed. They read about it in the agricultural papers of the day, and after reading about it you cannot keep them from buying it, and it must be a failure, in many instances a total failure, but they are going to buy a little and try it. There would be no use of planting any kind of corn in July, and it is so with crimson clover. Now, I have traveled over the territory to Toronto, Canada, and to the eastern shores of Maryland and Delaware, and over the whole country for three years, and observed this clover, not knowing what it was, but I was informed that it was crimson clover. It was a beautiful stand, but that land was sandy and I supposed that it would not grow here, but I have a brother-in-law that keeps Jersey cattle, in the eastern part of this county, and he says he has just such a crop as is here described, and that is poor, thin clay land, cleared off before I was born, and that was pretty early. It has grown up as thick as hair and it was in bloom this fall, and he says that nothing that he has ever grown is so valuable for his cattle as crimson clover.

Mr. S. H. Todd: I would say that the soil on which I saw this field of crimson clover was bottom land, very rich.

Mr. Reuben Rankin: I would like to ask what better reasons we have for believing in the sowing of this crimson clover at the time for being sown, than in sowing the common red clover. Now, the reason we do not sow red clover in July or August is that we strike a dry season when we are not apt to get a stand. Now, in November, I think the fore part of November, I had occasion to go across a neighbor's farm and I discovered that he had a most excellent stand of the red clover of about ten acres. The corn had been cut off and put in shocks, and at first I thought he had sown red clover on that field so many years that the ground had become so thoroughly impregnated with the seed that it came up as a volunteer crop; and I asked him, and he said "No, I sowed that clover the fore part of July." He sowed the seed and ran a little light harrow of some kind between the rows just after he had plowed the corn the last time, and I never saw a finer set of clover. The ground was completely covered. Now, the question to my mind is, if we could get a stand of red clover just as easy at that time, we would have a prospect of getting a good crop the next year.

Mr. L. N. Bonham: You are asking for some experience, I will contribute a little of my own with crimson clover. I think our success depends not upon the temperature or climate, but the degree of moisture in our soils. My farm is a bottom farm and it is what you call a dry, warm soil. Crimson clover sown last year, early in August, was an entire failure, because last year was a very dry fall. This year I experimented by sowing at five different periods of the season. The best stand

I had was sown in June, immediately after the laying by, or the last working, of the sweet corn. Again I sowed the first week of July under similar conditions where sweet corn had been grown, and the stand is very good. I sowed again the first two weeks of August, but the stand is not so good. In September I sowed again, but it is only a feeble growth, and the first of October I sowed again another piece. I had an idea that the question about this planting is not that of temperature so much as of moisture in our soils. If we have a condition of moisture in our soils where red clover will germinate readily, as the gentleman testified over there,—and we all know that our red clover will germinate at the time of laying by of corn, about three years out of four,—if the conditions of moisture of our soil are right we know it will germinate. So I feel safe in sowing red clover in that period, early in July or June. I would not sow crimson clover later than the first week of July unless I was sure of a wet fall.

Now, as to its covering qualities. It stools much more than the common red clover, and with the same number of seeds to the square yard, you will find in the fall of the year it covers the ground like a mat. I find that red clover kills quicker under a heavy frost and turns brown and stops entire growth in the fall quicker than my crimson clover. The first hard frost we had that turned our clover fields brown, didn't turn my crimson clover fields brown. The crimson clover was on a hill, I suppose ninety feet above the level of the bottom land below, which makes some difference in the temperature and effect of the frost, but the crimson clover kept perfectly green until the hardest frost we had in December, and then it turned white and looked frosty. But since that, where there is a southern slope, it has grown up again, it shows today some green under the frosty top; so that in the matter of temperature it will stand as high a temperature as red clover. It is simply a question of moisture to start it to germinate and give it a successful growth. Now, another thing about it, as to using it for hay. I think that is a claim that is not well substantiated. You have all read, perhaps, of the experiments made by the Department at Washington on the effect of the seed heads. You know the seed heads are long and slender and are covered with fibrous covering, and these when fed to horses, ball in the stomach and mean death in the end, but cattle can get away with them more safely. As a substitute for dry, red clover, it is not to be named; but as a covering crop I think it would be very valuable.

The President announced that the committee on nominations was ready to make its report, and thereupon the following report was submitted:

Mr. President and Gentlemen of the Convention: Your committee would respectfully present the names of O. E. Bradfute, of Greene

county, for president, and E. E. Elliott, of Preble county for vice president.

Respectfully submitted,

L. N. BONHAM,
J. W. POLLOCK,
H. W. PHELPS,
Nominating Committee

And thereupon a recess was taken until two o'clock, P. M.

AFTERNOON SESSION.

WEDNESDAY, January 13.

The President called the Institute to order at two o'clock, pursuant to adjournment, and announced that there was no action taken upon the report of the committee on nominations, which was presented just before the noon adjournment.

And thereupon, on motion, the report of the committee was unanimously adopted, as read.

The President: Is there any other business that should come before the Institute at this time, before we enter upon the regular program? If not, the first paper this afternoon is "Modern Methods of Cultivation," illustrated, which will be presented by Professor W. D. Gibbs, of the Ohio State University.

MODERN METHODS OF CULTIVATION.

By PROF. W. D. GIBBS, Columbus.

According to the last census we grow in the United States in round numbers,

Corn.....	72,000,000 acres.
Wheat	33,000,000 acres.
Oats	28,000,000 acres.
Rye	2,000,000 acres.
Barley	3 000,000 acres.
Cotton	20,000,000 acres.
Total	158,000,000 acres.

making a total of one hundred and fifty-eight million acres of land under cultivation. The vastness of this area, together with its economic importance is sufficient excuse for devoting a few minutes to-day to the discussion of methods of tillage.

Before entering directly upon the subject let us review briefly some of the reasons for tillage. Why is it essential?

Generally speaking tillage does two things: kills weeds and stirs the soil.

Weeds are injurious because they consume plant food and to that extent rob crops; they shade the soil and have a tendency to smother crops; they take large quantities of water from the soil.

Stirring the soil aids the formation of plant food, aerates or ventilates the soil, influences soil temperature, improves tilth, and in a measure controls the supply of moisture.

The plow is the oldest and most important implement of tillage. In general we may say that it has four functions. It cuts, lifts, turns and pulverizes the soil. There are many types of plows, but we may divide them all into two general classes; the prairie or sod plow, and the old ground plow. The principle function of the sod plow is to cut and to turn the furrow slice, only such lifting being done as is necessary to place the furrow slice at the proper angle when it falls. The pulverizing function is not emphasized in this type of plow; the furrow slice should be of uniform breadth and thickness, and it should turn evenly and smoothly without breaking. With the old ground plow we have a further object to accomplish. It should cut a uniform furrow slice and turn it evenly and smoothly, but in addition to this the furrow slice should be turned upon itself more abruptly so that thorough pulverization may be accomplished. The sod plow has long sloping mold board and oblique cutting edges, while the old ground plow has a relatively short, upright and abruptly twisted mold board with less oblique cutting edges.

There are two cutting edges on the plow; the share and the shin. There are several advantages in having these cutting edges oblique. *First:* the shin, coulter and share free themselves from roots, stubble and grass more perfectly, in the same manner that a sloping grain board allows the cut grain to be pushed off easily. *Second:* less power is required for the shin, coulter and share to cut through roots and other obstructions, for the same reason that a sloping section is better in a sickle than a right angled one. The total force required for cutting is the same in each case, in one instance it is applied more slowly and hence for a given space of time it is less. *Third:* the plow enters the ground more easily for the same reason that a sharp pointed stick may be driven into the ground more easily than one having a blunt point. *Fourth:* the plow also runs more steadily because the blow with which it strikes obstructions is distributed.

The land side is made necessary by the inequalities of the soil, the tendency of the horses to vary their course from a straight line, and most of all, by the friction developed on the mold board and share by the furrow slice. It should be of good quality steel and highly polished so as to move easily under this friction.

The draft of the plow depends upon its weight, the resistance in cutting, and the resistance in lifting and turning the furrow slice. Trials made by the New York State Board of Agriculture indicate the draft to be distributed as follows: weight, 35 per cent; cutting, 55 per cent; lifting and turning, 10 per cent. If this is correct, more attention should be given to keeping plows sharp than to the shape of the mold board.

The draft should be applied along a straight line extending from the point of attachment on the horse's collar through the point of attachment at the bridle of the plow to the center draft on the mold board. If the hitch is made too high or too low this line will not be straight and there will be loss of force.

Dynamometer tests indicate no difference in draft, on level ground, between walking and wheeled plows, the latter carrying a man. The reason for this increased efficiency is that wheels convert sliding friction into rolling friction. The weight in the riding plow is carried by the wheels instead of by the bottom of the furrow. A wagon of given weight pulls easier over an earth road than a sled of the same weight. In going uphill draft is greater in riding plows because of the extra weight that must be lifted to the height of the rise. The ideal farm hand will walk uphill and ride down.

The adjustment of wheeled plows is different from that of walking plows. With a wheeled plow the bridle or clévis at the end of the beam is set high, so that the bottom of the plow touches only at the cutting edge. The friction is thus transferred from the bottom of the furrow to the wheels. If the hitch is too low the tendency is to throw the weight of the machine and rider on to the sole of the plow and greatly increase draft. With the walking plow the hitch should be low so that the heel of the plow will hug the bottom of the furrow and thus relieve the sole or cutting edge, from bearing the greater part of the friction, and also with this arrangement the plow moves steadily, requiring less attention from the plowman.

Three-wheeled plows are coming into favor. By means of these the plow is more perfectly carried and at the same time more firmly held to the work. Also the tongue may be jointed so as to allow turning at a right angle more easily than can be done with a rigid tongue.

Experimental evidence is not sufficient to justify us in speaking definitely as to the effect of coulter on draft. Experiments by Sandborn indicate that coulters uniformly increase draft, while results obtained by Gould and others show different results. However it seems clear that they lessen draft in sod ground. Coulters of all kinds should be set immediately back of the plow point.

The plow is not a perfect implement. It does not completely pulverize and often packs the soil. It tends to compact the subsoil by pressure exerted on the bottom of the furrow. It is a slow process. Notwithstanding imperfections, it is the nearest perfect implement we have for deep and thorough work.

The draft of the plow is relatively great, but when we consider the amount of dirt moved, the draft is less than any of those pulverizing implements designed to take its place. Professor Sandborn tested this point by preparing a seed bed on a piece of unplowed corn ground on which the stalks and roots had been removed. Comparative trials were made, with the disc harrow, the acme harrow, the Lubin harrow, the Albion cultivator, the spring tooth harrow and the smoothing harrow. The average draft of these implements in preparing a seed bed was for each inch of dirt moved, eight and seventy-seven one-hundredths pounds, while the average draft of the plow under like conditions was five and twenty-four one-hundredths pounds. The draft of these instruments on plowed corn land was three and seven one-hundredths pounds for each inch of soil moved. In other words, the sum of the plowing and pulverizing was not equal to the draft consumed in pulverizing an equal quantity of soil without plowing. This does not mean that it is never cheaper not to plow, for in some cases the seed bed may be prepared cheaper and better by the pulverizers because the plow moves more dirt than is necessary.

The plow does not usually leave the ground in proper condition to receive the seed. As a rule the plowed surface is too uneven and irregular and is not pulverized. The plow is a poor pulverizer; in some cases it compacts the soil rather than pulverizes it, (plowing a loose, wet soil). It is necessary therefore to follow the plow sooner or later with some kind of pulverizing instrument.

POINTS TO BE CONSIDERED IN PULVERIZING.

First. The fineness of the soil. May test this by passing soil through sieves of various sizes.

Second. The looseness or compactness of the soil. The disc harrow tends to loosen the soil and make it fine, while the tooth harrow tends to make it fine and at the same time compacts it. Wheat needs a compact seed bed. Corn needs a loose seed bed. Hence we may say that for most soils we would use the smoothing harrow in preparing a seed bed for wheat, and the disc harrow in preparing for corn.

Third. The amount of draft required to pulverize a given amount of soil. The Lubin is probably one of the most perfect pulverizing instruments that has been invented and would undoubtedly come into general use if draft were not an object.

Fourth. The depth to which the instrument will pulverize. Smoothing harrows, drags, etc., are good surface tools. The acme is probably the most perfect surface pulverizer we have, while for deep pulverization the disc excels it, although the pulverization is not so perfect.

Fifth. The shape in which the surface is left. The greatest fault of the disc harrow is that it ridges the ground. The tooth harrow levels the surface. In fact the smoothing harrow more often acts as a leveler than as a pulverizer. The roller and the drag differ in this, that while the roller pulverizes it packs, and while the drag pulverizes it levels. Of course each levels and each packs some.

Sixth. The shape in which the ground is left directly under the pulverized soil. The disc tends to leave the subsoil in ridges and tends to make a marked difference between the pulverized and the unpulverized soil.

Seventh. The effectiveness of the instrument in covering seeds. The disc is best for covering oats. The smoothing harrow is best for grass seeds.

Eighth. The cost and durability of the implements, simplicity of construction (adjustable smoothing harrows).

No one implement can possibly excel for all classes of soils and crops. What will be the best pulverizer for one set of conditions will not be for another. Every locality has its peculiarities. It has been said that if you know the kind of harrow a farmer uses you know what kind of soil he has.

KINDS OF PULVERIZERS.

First, the common tooth harrow in all its forms, square tooth, round tooth straight tooth, slanting tooth, and those that may be made either straight or slanting. The form that is best to purchase will depend upon your soil and the implements already on hand. If you have a disc harrow or a spring tooth harrow, your tooth harrow may be much lighter than when you depend upon the tooth harrow alone for pulverizing.

Where the tooth harrow is the chief pulverizing implement on your farm it is hard to improve on the straight, square tooth, wooden frame harrow made in three sections. It needs to be heavy both for effectiveness and strength. It should have handles on the outer sections for the purpose of removing trash.

When other pulverizers are used and a lighter harrow is permissible the combination straight and slanting tooth harrow made entirely of iron is to be recommended. The only advantage in the combination harrow is that it saves you from having two harrows. It has the disadvantage of being easily broken.

Second, the drag. This implement is used chiefly in old, uneven, cloddy ground, where it seems to pulverize the clods and level the surface of the ground.

Third, the spring tooth harrow, consisting usually of a strap spring, is an excellent implement for deep pulverizing. It is especially valuable on heavy, stony ground where the disc cannot be used.

Fourth, the acme harrow, consisting of a series of slanting knives, is a perfect surface pulverizer. The objections to it are: pulverization is too shallow for some purposes; it is heavy draft and it is not suited to stony ground.

Fifth, the disc harrow. These are the most effective implements we have for deep pulverization and for making the soil loose. They do not make the soil as fine as do some other implements. They are most effective on soils that pulverize with little movement. They do not work so well on heavy clay soils. They do not work well on stony ground but on ground containing much vegetable trash they

are excellent. The disc form does not go so deep as the spading or cutaway disc, but pulls harder and is a better pulverizer.

The President : If any one has some special point in mind, he would like to ask Professor Gibbs, we will give a few minutes to it.

Mr. Reuben Rankin : I do not quite understand the expression that 35 per cent. of the draft is due to the weight of the plow.

Professor Gibbs : I gave as the authority, the work done by the New York State Board of Agriculture and published in one of its reports. I do not now remember the year. It means this : first we may say the draft of the plow is due to three things, the weight of the plow, the resistance in cutting and to the resistance in lifting and turning the furrow. Its result showed that 35 per cent. of the draft of the plow is due to the plow's weight ; that is, the weight of the plow on the bottom of the furrow, produces 35 per cent. of the draft. I state that on the authority of the report.

Mr. Rankin : Is that based upon the proposition that if the plow were drawn upon the surface of the ground without any resistance, or in what way is that calculated?

Professor Gibbs : As I understand the report, it means simply the weight of the plow.

Mr. Baker : Is there any advantage in a right hand plow?

Professor Gibbs : I do not think there is any advantage whatever. I simply took that form for convenience.

Mr. M. I. Todd : Suppose you should change the form of your plow, wouldn't it change the entire proportion of your figures on the canvas? Would it change the draft and make it lighter or not?

Professor Gibbs : I think we have every reason to believe that the shape of the plow has a great deal to do with the draft.

Mr. Todd : Then we cannot rely upon this demonstration?

Professor Gibbs : I simply give it for what it is worth. It gives one an idea of the draft of the plow. Before testing the matter I had no idea how much force was required to pull a plow. In the case mentioned it was about four hundred and twenty-five or four hundred and fifty pounds.

Mr. Legg : I would like to ask the professor just how we are to know, in hitching to a breaking plow, where the point of resistance is ; that is, in taking the point at the hame as one, how we are to know just where the other point of resistance is, whether the depth that we are plowing would have anything to do with it? Now his scale indicates that a plow turning a ten-inch furrow would require a weight of five hundred and seventy-five pounds to draw that through the ground nine inches deep. I would like to know why it is that a pair of horses that will weigh probably twenty-eight hundred or thirty hundred will have about all they can do to draw that plow through ordinary soil all day, the resistance being only the small amount of five hundred and seventy-five pounds?

Professor Gibbs: Well, they pull it all day. It is not a question of how much they can pull at a given moment. It is wearing on them. You carry a ten-pound weight all day and it becomes quite heavy before night.

A Gentleman: I would like to ask the professor if there is any difference in the draft between attaching the cutter to the beam or to the share?

Professor Gibbs: I see no reason why there should be a difference, if the cutter is set at the right place back of the point of the plow, as I think it should be. I see no reason why there should be a difference in the draft, whether it is on the beam or on the share.

The President: I suppose we have spent all the time we should on this subject. It is very interesting and we might spend the whole afternoon on it, but we have other subjects before us.

Inasmuch as some of the members of the institute are obliged to leave this afternoon it has been thought best to change the order of the program a little, and Professor Galbraith has kindly consented to give way to the second subject on the regular afternoon program, that of "The Wool Industry, Present and Prospective," which is to be presented by Mr. C. S. Chapman, of Marysville, Ohio.

THE WOOL INDUSTRY, PRESENT AND PROSPECTIVE.

By MR. C. S. CHAPMAN.

In considering "The Wool Industry, Present and Prospective," it seems almost fallacious, as I take it for granted that each and every person in this audience knows too well the sad and depressed condition into which it has been driven by adverse legislation.

I know that it is not the part of wisdom or good judgment, in an agricultural meeting, to refer to matters or bring them up so that they would appear to be partisan or political, but in presenting the present condition of the wool industry it is impossible to present it in its true light without connecting with it the effect of the tariff legislation, for like a mathematical problem it resolves itself as follows—the wool industry, present, was made by legislation, the wool industry, prospective, depends on legislation.

Let us go back for a few moments and consider what efforts the pioneers of this country put forth to build up this industry in the United States, knowing that for the good of a large portion of our lands they should be trod by the golden hoof.

History tells us that in 1654 the state of Massachusetts being in great straits for, clothing and as the most likely way tending to a supply in that respect was in increasing the number of sheep; it was ordered by the general court that no ewes or ewe lambs should be transported out of the country to any foreign port or place under penalty of five pounds for every one so exported, a penalty of almost twenty-five dollars.

In 1802 the Agricultural Society of the state of Massachusetts presented Hon. David Humphreys with a gold medal for his patriotic exertions in importing into New England the Merino breed of sheep. The state of Connecticut at this time made rapid progress in improving its flocks of sheep. Woollen manufactories grew and

flourished and made their influence felt in national politics. The importations of Humphreys, Jarvis and others brought fabulous prices. Advertisements were accompanied with marvelous statements of the value of the wool and the great benefits in raising it.

The barren hillsides gave promise of rich returns for their scanty pasturage and the worn out lands were to be enriched by the pasturing of sheep upon them whose fleeces were in turn to enrich their owners.

In 1810 the state of Connecticut passed an act requiring that the wool used by the factories should be produced in the state and that the cloth made in the family should be from wool grown in the county. Thus you see that the wool industry from its infancy has been nurtured and rocked in the cradle of protection, and from the early settlement of this country down to the present time it has prospered just in proportion to the legislation that supported it.

The tariff of 1824 gave great stimulus to the fine wool industry while the tariff of 1846 was ruinous, compelling the breeders of many of the eastern states to turn their attention more to the production of mutton, and every tariff act has had its influence for or against the wool industry up to the present time.

Let us look at the present condition of the wool industry from the standpoint of an Ohio wool grower, and see if we have not to a certain degree been careless and negligent of our interests.

During the civil war the demand for wool was great, having not only millions of men for consumers but also as destroyers, so much so that the price of wool in Ohio went to over one dollar per pound. Manufacturers were free purchasers, also dealers and speculators, buying it without care and discrimination, regardless of condition. The producers became reckless and sought the breeding of that class of sheep that produced the greatest number of pounds of wool, grease, sweat locks, etc., to the weight of carcass. What was the consequence? In time the manufacturers began to discriminate as to the condition of our wools claiming that in many instances the fleeces were what they termed "stuffed," that our wools were not carefully and properly handled. They (the manufacturers) with a keen eye to their own interests, began to look around for wools that *were properly* and carefully handled. Soon we heard that the Australian wools were taking the place of a large portion of Ohio and Pennsylvania fine wools, owing to their being put up in much better condition, manufacturers claiming that they lost less in scouring, as their fleece wools were skirted and nothing put in the fleece but the body wool.

This in my opinion had its influence with the manufacturers and made them eager for a revision of the tariff and anxious for them to have what they termed "raw material free." With wool on the free list how can we produce it in competition with such countries as Australia, where their rentals are comparatively nothing; where sheep can live twelve months in the year on grass, with such an even climate that a correspondent of the Breeders' Gazette said that they could plant corn every month in the year with as much assurance of its maturing one month as another?

The producers of wool in Ohio were not quick to grasp the necessity of reformation and resist this competition with a proper condition of their products, but to a large extent continued to market their wools in that undesirable condition, and to produce those wools of heavy and undesirable weights. Our breeders lost sight in a great measure of size, form and carcass of their sheep, so that when the price of wool became reduced to such a low figure as not to be remunerative they had not mutton enough to meet the deficiency.

What was the consequence? Thousands of Spanish merino flocks were sacrificed, and they have rapidly disappeared since the tariff of 1883. Statistics show the number of sheep in Ohio to have reached in 1868 over seven millions, and their value to have been over fourteen millions of dollars; this was the highest point in numbers and values, and after the tariff of 1883 they decreased so that in 1890 we

had only three millions and a fraction. The effect of the McKinley bill to the wool industry was never felt from the fact that between the time of its passage and the time it was to take effect, there were imported into this country wool and woolens enough for the people of the United States for eighteen months, if there did not a spindle turn in this country.

Henry Clews in the Bankers' Magazine of that year said that the importations were so heavy that it almost produced a money panic in New York.

The result of the national election of 1892 was seemingly a death blow to the wool industry, as the fight was made upon the question of the tariff. The laboring classes of this country were taught to believe "that the tariff was a tax," and the question was presented to them, "How does the tariff benefit me?" and I must say that this question came forcibly to the farmer who was not producing wool and he said, "I am not my brother's keeper." What a fallacy. For if the election of 1892 had been directly on the extermination of the wool industry of the United States the legislation that followed could not have been more effectual.

What was the consequence? Thousands upon thousands of sheep were sacrificed, and many, many farmers who had made wool their principal product were compelled to seek other pursuits, coming in direct competition with the breeders and feeders of horses, cattle and hogs, and many of them to the raising of grain; throwing up to the light of day soil that in many cases the sun had never shone upon and destroying our beautiful green pastures that had been the pride of our forefathers and had been handed down for generations as a birthright, also securing to many of our people a living and building up lands that had been exhausted by the productions of cereals.

It was a great calamity when *wool* was made the keystone of the arch of protection, so that for years past the wool grower has found it an extremely difficult matter to keep one eye on a congressman in Washington and the other eye on a flock of sheep in Ohio.

This demoralization has brought the wool industry of the present into a very chaotic condition, when we consider the loss to individuals, townships, counties and states; statistics show that the loss in Union county, Ohio, by the destruction of sheep and wool industry, is six dollars per capita.

We have always been a country of diversified industry and while it affects us greatly, what is the loss to those counties and states that were making the production of wool their chief product?

It seems strange that our lawmaking powers cannot see the great importance of protecting all industries, not necessarily to a monopoly, but to make them remunerative. We as a nation should guard every avenue of labor and be jealous of our rights, securing to America and its products the markets of America, and let the markets of the world be governed entirely on the basis of reciprocity. Without these we would soon be in the condition described by Prof. Huxley.

"A population whose labor is insufficiently remunerated must become physically and morally unhealthy and socially unstable, and though it may succeed for a while in industrial competition by reason of the cheapness of its produce it must in the end fall through hideous misery and degradation to utter ruin."

When we look over the lands that in years past were dotted with sheep, and see such a vast extent of country that is only fitted for the production of wool, what is the outlook for the future?

After the result of the national election of 1892, when the wool industry of the United States was committed to the hands of a president and congress pledged to put wool on the free list, and the leaders of protective principles were dazed and disheartened not knowing what the policy for the future should be, the first word of encouragement and the keynote of the future was sounded in January, 1893, by our brave and gallant Napoleon, "The Hero of Protection," William McKinley.

In his speech before the Lincoln banquet in this city in 1893, he proclaimed to the world that we should fight it out on that line and that the principles of protection were right and would prevail.

"What can be done by legislation can be undone by legislation," so that the flock masters and producers of wool have looked upon him as the Moses to lead them through the wilderness and to the promised land governed by the principle of protection.

With what pride we should look upon our shepherds who have had the courage to cling to their flocks through such a period of adversity. The result of the recent election demonstrated that the people demand a tariff to furnish the running expenses of this government; also a tariff that will give to the wool producers that protection that will make the industry profitable and start the mills and factories and give to the laboring man remunerative wages.

During the campaign last fall they had in a demonstration a sheep on a platform wagon and the following inscription:

"Protect me and I will pay your mortgages."

When the farmers of this state were receiving adequate prices for their wool, and their surplus sheep were marketed at profitable figures, the foreclosures of mortgages and the sale of farm lands by the sheriff were very rare.

When we consider what the wool industry requires to make it remunerative, it is strange, *passing strange*, that we should have a legislator in either of the halls of congress that would oppose it.

Under the McKinley bill the average duty on fine wool was about eleven cents per pound; now let us see what effect that would have on the consumer. An ordinary suit of clothes contains about three and a half pounds of wool, making an increased cost of about thirty-eight cents on a suit of cassimere or worsted, so that really the cost of the wool cuts no figure to the consumer but gives an industry to our American people *that no other industry can fill*.

To show the drift of sentiment of our people the congress elected in 1894 was more strikingly protective than that which passed the McKinley bill.

The state elections in 1895 were a more emphatic declaration in favor of protection. The election of 1896 showed a popular majority of 600,000 on the same side.

Congress does not need to wait for any further expression of the popular will on the tariff question.

Let the wool growers of Ohio consider carefully the demands of the manufacturers, putting their wools in the best of condition and in place of producing short, gummy, undesirable clips, let us produce a wool combining length and strength of fibre with only enough oil or yolk to preserve the felting properties of the wool, breeding a sheep combining wool and mutton properties and retaining the flocking properties of the Merino.

While many of my hearers may not bear me out in this statement, in my opinion the acclimated sheep for the production of wool in Ohio is the merino, they are the only sheep possessing successful flocking properties through a series of years, and are susceptible of being bred for form, size and early maturity.

Give us a protective tariff on the finished product of the wool industry equal to the tariff demanded on the finished product of the woollen manufacturer, and the flocks of this country will increase to such an extent that the *hills, valleys and plains* will be dotted with that emblem of purity and the people rejoice and be glad.

The President: The paper is now before you for brief discussion.

Mr. Reuben Rankin: I would like to ask Mr. Chapman if iron ore and coal to the miner, and corn and wheat to the farmer, are not as much finished products as the wool when first clipped, to the wool grower?

Mr. Chapman: The iron ore and the coal, the very minute that the labor is put upon it, represent a finished product. That was answered fully by Mr. Ingalls in his talk upon what we term the Wilson-Gorman bill. The only thing that is an unfinished product or a raw material is something that represents no labor at all. As soon as iron ore is taken from the mine and put upon the car it represents the finished product of the miner just as much as the product of the wool producer when he clips it.

Here the president called for the report of the committee on resolutions, and Mr. F. A. Derthick, chairman of the committee, read the following:

WHEREAS, The United States Department of Agriculture was elevated to the dignity of a cabinet position in response to the continued appeals of the farmers of the country, who indulged the hope that its increased influence would promote the interests of agriculture; therefore be it

Resolved, By the members of the Ohio State Farmers' Institute, assembled in Columbus this 13th day of January, 1897, that we earnestly request President-elect McKinley to appoint a practical farmer to the chief position in this new department of the public service; a man who, by reason of his wide acquaintance with leading agriculturists in all of the states in the Union, is in full sympathy with every effort for the relief of the depressed condition of agriculture, whose unswerving integrity and devotion to the agricultural interests of the country preeminently fit him for the responsible position of Secretary of Agriculture of the United States.

Resolved, That we believe that Col. J. H. Brigham is possessed of all of the above qualifications, and as his candidacy is now being urged by farmers in all parts of the country, irrespective of state lines, we respectfully ask his appointment.

Resolved, That the secretary of the State Board of Agriculture be requested to send a copy of these resolutions to Hon. William McKinley, the President-elect.

We recommend the reorganization of the Live Stock Commission of the State, placing it under the management of the Secretary of the State Board of Agriculture, and the enlargement of its duties and funds for work in investigating and suppressing contagious, infectious and parasitic diseases among live stock.

We deplore the failure of the state senate of last winter to pass the bill to protect the people against fraudulent substitution of fibers in articles of clothing. We declare that in our judgment the bill passed by

the house was a just and feasible measure, and demand that a law embodying like provisions be enacted at the next session of the legislature.

Resolved, That the thanks of this Institute are due and are hereby expressed to Col. Fred Blenkner for courteous attention in supplying seats, lights and otherwise ministering to the wants of the Institute.

Respectful y submitted,

F. A. DERTHICK,
L. P. BAILEY,
H. P. MILLER,

On motion the resolutions were adopted.

Committee.

REMARKS BY MR. ALEX. GALBRAITH, Janesville, Wis.

MR. PRESIDENT AND GENTLEMEN: At this late hour and with other gentlemen to follow me on the program this afternoon, I am sure I will suit all by cutting my remarks pretty short.

This question of value in pedigree reminds me of a picture which I saw some years ago in that great London comic weekly, *Punch*, where it represented a shorthorn bull, a splendid specimen accompanied by his owner, a noble lord. It went on to illustrate ancestry. The lord was rather a diminutive, insignificant little man and he addresses the bull and says "What a magnificent fellow you are! What handsome proportions!" The bull replies "Yes, if your parents had been selected with half as much care and judgment as mine you might have been as good looking as I." (Laughter.)

The law of nature which teaches us that like produces like, applies in the horse as in every other kind of animals, and what is known as the law of atavism or casting back must always be reckoned with. The Scotch people have a saying that a good cow is all the better from being of a good family. And the history of the great men of our country and all countries shows that there never has been a man of unusual ability, foresight and sagacity, but that had a good mother. I have never seen a good animal that hadn't a good mother.

Now, I will speak first of all about the dams or mares. The most prominent characteristic which our breeding mares ought to have is femininity. They must be females in their appearance and character. If a man buys a dairy cow he doesn't look for a strong, fleshy animal, but the reverse. And in my experience I find the best breeding mares are those decidedly feminine. Now then, we want our males to be strongly masculine, decidedly so, and with these two characteristics on either side you get the very best results.

Another thing that you must keep in mind is the necessity of breeding animals that are typical of their breed, that are not accidentally large nor accidentally small; breeding from accidental parents will result in getting accidental colts, and they are very uncertain, unsatisfactory breeders.

Now, when I was across in England last spring I had the pleasure of meeting Professor McCall, of Glasgow, one of the most eminent breeders and veterinarians there, and he told me that his observation of over thirty years had led him to believe that the stronger parent at the time of mating always influenced the offspring and very often controlled the sex; that if the sire were a stronger and more vigorous animal physically at the time the result would be a female very often, and would take after the sire. If, on the other hand, the dam were the more vigorous and healthy, a male would be the result and show the characteristics of the mother. Now, that is a disputable point. I do not know that I have observed that myself, but coming from an authority so high as Professor McCall, who stands at the head of his profession and who is a close student of animal life, I think it is worthy of consideration. Another gentleman there, Mr. William R. Trotter, than whom there

is no better judge or writer on horse topics in all England, said to me, and he has put it on record publicly since, that the male animal ought to be especially good in its action and limbs; that the mother ought to be especially good in her head, neck, body and respiratory organs, because those were the qualities that would go to the progeny.

These, of course, are theories, but coming from men, as I said, of high standing and long experience they are worthy of being considered carefully.

My advice to you in crossing is if you find a cross or combination that seems to "nick" properly, do not experiment any further, but stick by it. Study closely those animals of your own and of your acquaintances that have been extra good, and of men who have been extra successful breeders. Study the ancestry and follow it closely comparing it with your own experience and your neighbors' and other intelligent breeders' throughout the country. In selecting your animals for breeding purposes keep in mind above everything hereditary disease. Insist upon absolute soundness in every respect, for only by so doing are you on safe ground. And in choosing those animals that are sound consider the animals that they came from. Look to the dams, the granddams and the great granddams, as well as the male parents.

Now, I find in England a great disposition to breed their fillies at the early age of two years. They believe it is better to breed at two years old than three. I do not think it is followed in this country to any extent and do not think it advisable. They breed at two and if successful they get a colt at three; but if the mares don't catch at two they run over to four years old so that the owner gets two years' work out of them first, and coming in at five years old they are generally more mature.

Now, a word, gentlemen, about our stables and barns. Too little attention, I find, is paid to the ventilation and cleanliness and drainage around our barns, and particularly in regard to the drinking water of the horses. We shut our eyes to the fact that a great deal of damage is being done while we are unaware of it. The ventilation, as you all know, is of great importance, and in ventilating your barns there is one thing you must keep in mind and that is the danger of having a draft between the ingress and egress of air. If you allow a draft there is liable to be rheumatism or some other trouble amongst the stock.

Then you all know the value of cleanliness. It is unnecessary for me to say anything about that. Indeed I do not know that it is necessary to make these remarks to you at all, because I believe that Ohio farmers have been in the very front in horse breeding. I consider that you are the pioneers in draft horse breeding particularly.

I do not wish to occupy your time further, but I would just say this that if you use your best judgment in the selection of breeding stock, you will keep the pedigrees in view, you will look back to the sires and the grandsires and the great grandsires; and the dams, the granddams and the great granddams; you will study them closely and keep clear of all unsoundness and undesirable qualities in your animals. Breed to the best that you can get. Aim high. If you do not aim high you will never attain very much. Remember that breeding horses is no game of chance. It is founded on regular scientific principles, and it is only the one who aims high and uses his very best judgment at all times, keeps a close lookout on what his neighbors and the most successful breeders in the land are doing, that can hope to get a satisfactory reward.

The President: If any member has any questions to ask Professor Galbraith on this subject or has any experience or pertinent observations of his own there is an opportunity now to present them. If there are no

questions we will take up the next subject on the program, which is "The Silo." This subject is to be presented by Mr. F. A. Derthick, of Mantua, Ohio.

THE SILO.

By F. A. DERTHICK, Mantua, Ohio.

The introduction of the silo as a factor in modern agriculture has not met with that general favor which its merits demand, and, although an increasing number of dairymen and stock raisers are availing themselves of the advantage of ensilage, the majority is still very large who cling to the older system of dry fodder. This is in part, due to the extravagant claims made for ensilage by the early pioneers in the new departure. These enthusiasts insisted that by some unknown and mysterious process taking place in the silo, the food value of the fodder was increased. Later scientific investigations exploded this fallacy and thus suspicion was aroused against the system.

The advantages of ensilage have been found to lie in another direction, and that instead of there being any addition to the food value there is an actual loss brought about by the conversion of at least a part of the starch and sugar into various acids (lactic or acetic or both.) The Wisconsin Experiment Station after a study extending through a series of years now declares that there is a loss in the nutritive food value of 16 per cent. in both dry matter and protein as against a loss of 24 per cent. on the field dried fodder. It is evident that this slight difference will not in itself justify the outlay necessary for the construction of a silo.

The advantages of the silo may be summed up as follows: Silage furnishes a succulent summer food in winter, thus making it possible and profitable to produce milk during that season of the year when the market is comparatively bare of milk, cheese and butter. This feature alone will prove of incalculable benefit to the dairyman, as it will give a more uniform price for dairy products by withdrawing a part of the surplus of milk from the summer months. Again, the value of silage is supported by economic principles, as the complex changes going on in the silo render the food more digestible and easily assimilated; especially is this true in the case of corn silage. The effect of the moisture and heat of the silo is much like the cooking of food in so far as putting it in the very best condition to be digested. Many insist that the digestive organs of the animal are thus relieved to a greater degree than when the grain is taken to the mill and ground.

Silage is also more palatable than dry food and is received with greater avidity by all kinds of stock accustomed to its use. The moist and softened condition of the coarser portions of the stalk, hitherto rejected in great measure, are thus laid under contribution to the food supply of the farm. This is in line with the findings of our scientific friends who claim that the lower portion of the stalk has as great feeding value as the corn itself.

It is not claimed that silage is a properly balanced ration, but it should be supplemented by some food richer in protein. Various tables are given by scientific men as constituting a formula in which the necessary constituents of a nutritive food ration are present. From a large number of inquiries, as well as from observation of the most successful dairymen, the following table is suggested, as a day's ration:

Ensilage—45 pounds.
Clover hay—8 pounds.
Bran—6 pounds.
Oil meal—1 pound.
Total—59 pounds.

This ration can be furnished at an average of ten cents. There may be those who can figure the cost of the cow's daily keep on dry fodder at as low a point, but it will not be admitted that an equal flow of milk will result or that the animal will be in as good condition. If the above statements be true, they become very suggestive along economic lines. In these days of close competition and struggle to live, it becomes necessary to accomplish the greatest possible results from a given area of land.

The venerable Hiram Smith, of Wisconsin, it is said, succeeded in keeping one hundred cows on one hundred acres. This would be a fulfillment of the declaration that "To him that hath shall be given." If this high water mark should be approached in any considerable degree the question of commercial fertilizer would no longer be a nightmare to the Ohio farmer. Such intensive farming would yield an abundance of home made fertilizer and the nearly two millions of dollars expended in some years by the farmers of this state would be left in our pockets.

Four acres would be a conservative estimate of the amount of land required by dairymen to keep the cow the year round by the dry fodder system. The average dairy farmer is not keeping one cow on four acres. How does this compare with the silage system? A cow fed forty pounds of silage each day would consume seven and three-tenths tons during the year. Twenty-one tons would be a fair estimate of the amount of corn that can be grown on an acre, although many of our friends claim to exceed that, while some fall below it. Taking the above amount as the basis, it will be seen that three cows could be kept on the silage produced on one acre. Now, if we give each cow six pounds of clover hay, it will require practically three tons to keep the three cows the year round. This amount of clover hay can be grown on one and one-half acres. We have thus used but two and one-half acres and have still left one and one-half acres to run the three cows to pasture to compensate for the slightly less amount of ensilage and clover, as given in the table.

From these estimates it will be seen that the dairy farmer with one hundred acres of land and mill feed, as given in the table, could keep seventy-five cows, and as before noted, this would dispose of the question of commercial fertilizer. This will no doubt be voted a Utopian view of agriculture and be the occasion of sharp criticism as well as discussion. Should this be the case the end and aim of this paper will have been reached.

John Gould gives the entire cost of one ton of ensilage as eighty cents. Inquiries extended over a wide range places the cost nearer one dollar. A very successful siloist in Erie county gives the cost, including construction of silo, at one dollar and twenty-five cents per ton. The silo he builds in the following manner: The studding are two by six, placed about twenty inches apart near the bottom and increasing the distance as the top is approached. These are securely fastened at the corners. Lining is composed of straight-edged boards, one by six, double thickness and breaking joints. Between the two linings is placed thick paper coated with tar. It is further secured by placing a strong beveled piece of timber in each corner, securely fastened. The bottom can be prepared by cementing or if of stiff clay used without.

The first silos erected were for the most part of stone or brick, and when stone is at hand it is a question whether such are not cheaper in the end, as they are practically indestructible, not being likely to spread with the pressure or be affected by the acid of the silage.

Numerous attempts have been made to create a prejudice against the silo by charging tainted milk from cows where silage was fed. This charge has never been sustained where the silage was bright and wholesome and fed in moderation. Many of our most fastidious consumers express their preference for silage milk.

A variety of green crops may be used as silage; clover, millet and the soja *nodosa* are said to give satisfactory results. It is to corn, however, that we must look

for ideal silage. The leaming and mammoth ensilage are more often used than any other varieties. The pioneers made the mistake of cutting the corn too immature, thus missing the best results. The practice now is to cut when the kernel is dented and glazed, yet before fully ripe.

In filling the silo great care should be taken to pack every part of it closely. The corners should receive especial attention. The secret of good silage, like that of canned fruit, is in making it *air tight*. The silo should be of such size that one day's feed will require at least two inches from the entire surface of the silo. Shallow silos are to be avoided, as the greater the depth is, the more pressure, a condition which is in every way desirable.

It is not claimed by this paper that a silo would be profitable in the strictly grain growing sections of the state or country, at least not so long as large amounts of coarse fodder are either burned or plowed under for fertilizer. It is suggested, however, that the silo would be valuable upon such farms as are carrying any considerable stock, either horses, steers, sheep or hogs. All animals eat silage with a relish and as a condiment it would be no mean factor in contributing to the general healthfulness and thrift of the herd or flock.

To the dairy farmer the silo is a boon and has come to stay. Those who have used it longest are its firmest friends. Mr. Clark of Portage county, an intensive dairy farmer and one of the most careful and reliable men in northeastern Ohio, has made repeated experiments comparing the value of silage with that of dry fodder. He began by feeding his cows clover hay, bright cornfodder and bran, for ten days, then changing to silage for the same length of time, thus alternating for a considerable season. The yield of milk from each cow was weighed and a careful record kept with the cow by name. He found that in each instance the flow of milk increased when silage was fed and decreased on dry fodder.

This and similar testimony would seem to compel an assent to the following statement: *The silo has come to stay.*

The President: The subject of the silo is now open for discussion.

Mr. L. N. Bonham: The gentleman in his paper spoke of ensilage being a suitable feed for horses, cattle, sheep and swine. I would like to ask him if he has had any experience with hogs, and if so, what has been his satisfaction?

Mr. Derthick: Yes, sir, I have had much experience in so far as having done it by proxy is concerned; that is, I have friends in the state who are keeping hogs. Of course, the gentleman knows we are not doing that in our part of the state, but I have been told by those who do, that hogs eat it with a relish, that it contributes to their healthiness.

A Gentleman: I would like to ask the speaker if he considers ensilage a safe food for horses?

Mr. Derthick: I have never known of any trouble. There is a large number of silos in my neighborhood and the horses are fed ensilage and I have known of no complaint.

A Gentleman: The reason I asked the question is this; a gentleman in our county last season lost nearly all the horses he had from feeding ensilage. He sent for a competent veterinary surgeon and he pronounced the cause of the trouble to be ensilage, and advised him to cease feeding it. The neighborhood regarded it with alarm, and thought

it was a disease and the veterinarian said it was from the effects of eating ensilage.

Mr. Derthick: As far as experience goes, that is an exception, I think, if the horses were salted at suitable times, or at least so far as my experience goes, that is the case. I suppose there is a large number of gentlemen here who have silos and I will almost warrant they have fed their horses ensilage, not constantly, not a large amount, but as a condiment; at least I should be glad to hear from gentlemen who have had experience.

A Gentleman: I would like to ask Mr. Derthick how he would build a silo; how deep down in the ground, if at all; what dimensions, how large square and how high. Also I would like to know if he has a silo of his own? (Laughter.)

Mr. Derthick: Now, what an unkind cut that is! You have heard of the man who wrote, "What is home without a mother?" That has been traced down to a man who, so far as I know, didn't ever have a home in his life and he didn't know his mother. And I must confess it is a fact, I have not a silo. Now, "I am fair game and free plunder;" but I have a neighbor who is more favorably situated for marketing, and that man keeps seventy-five cows and has a silo. I live three miles from the depot, and the train leaves for Cleveland at 5:20 in the morning, and I do not get up in the morning to send milk to Cleveland. Our factory is not a winter factory and therefore I could not use the milk in the winter time, but let me say to the gentleman I am going to have a silo.

Mr. T. R. Smith: I have a silo and I see some advantages and some disadvantages. I am satisfied mine is not built right. I think it is built stronger than my brother recommends. My silo is square, and I am satisfied that is not the proper shape, and I will tell you why. It is twenty-two feet deep. The elevator carries the ensilage up and drops it in at the top, and it falls down, and the heavy part, the stalk and the ear, the solid part of the stuff, falls to the center and the husk to the outside, and it is almost impossible to keep it of a uniform consistency or solidity. There is no difficulty about the center. In the center, where the ear falls, it is splendid feed; it cannot be beaten. I am satisfied that the silo ought to be eight-sided or round.

Mr. Derthick: Don't you have a man or two men in there?

Mr. Smith: Yes, sir, it depends a good deal on the man. I had a man and he didn't do it to suit me and I went in myself, and I could not do it myself quite right. The light stuff drifts and the heavy stuff falls straight down.

Mr. Derthick: Wouldn't that objection be urged against any form of silo?

Mr. Smith: Not so much. You cut off the corners and you can pack it more uniformly.

Mr. Derthick: This beveled piece of timber in the corner makes something of a round corner.

Mr. Smith: So you put a belt around it?

Mr. Derthick: No.

Mr. Smith: This is not the trouble. There is an immense pressure in the silo, and I would recommend if you are going to build a frame silo that you build it in two or three sections, and make your foundation, or first story, eight or ten feet high; then as you go on up your upper studding should be a little farther apart. The pressure is greater as you get near the bottom. My corners are all right.

Question: How long is your studding?

Mr. Smith: Twenty-two feet. The silo is twelve feet square. The studding, two by ten inches, twenty-two feet long. I want to say further, before I close, that my cows did splendidly on my feed. They kept fat and gave a good supply of milk, and the assessor said I had the finest lot of cows in the township.

Mr. Derthick: I would not dig down in the ground, except to have it in proper condition. My neighbor, almost within sight, built one of the first silos I ever saw, and he built it of stone. He got a good foundation and it seemed smooth on the inside.

A Gentleman: I would like to ask the dimensions of that stone silo?

Mr. Derthick: It is calculated to hold one hundred tons.

A Gentleman: I have used ensilage two years. I built two silos. They are twelve feet in the clear, six feet in the ground and stand side by side, walled up with stone and cement twenty feet above the ground. Now, the gentleman speaks of having trouble with his ensilage. I have not a particle of trouble. My ensilage is really better at the outside than in the center, from the fact that it is not as damp in the center of the silo. The trouble with this brother is that he has a man in there that will not fork the stuff around the outside.

Mr. Derthick: The gentleman was in there himself. (Laughter.)

A Gentleman: There is no difficulty at all about spreading, if you build your silo right. It can be built very cheap and strong, but the question I wanted to ask Mr. Derthick is in regard to corn. What kind of corn do you use, that you derive the most benefit from? My experience is that common field corn makes the best ensilage, although the red-top will make perhaps one-half more ensilage.

Mr. Derthick: Mr. Gilbert, of New York, was a veteran with the silo, and I had the pleasure of going with him two or three weeks, and heard what he said about the silo a good many times, and his experience coincides with that of the gentleman's, that the common field corn is better than anything else he ever used.

Mr. O. E. Bradfute: I think I see how Mr. Smith could easily overcome his difficulty by hanging a swinging chute and sending it into the corners without any labor. It could be easily arranged.

I want to ask Mr. Derthick, or any other man in the house, what he knows about the use of silage for stock cattle and for feeding cattle? He speaks, I believe, only of dairy feeding. There are some of us interested in another line. I would like to know something about it. There are none in my neighborhood, and so far as I know, none have ever been tried for that branch of feeding.

Mr. Mills, Portage: I arise to answer the question in regard to feeding it to horses. I have used a silo for about ten years. My first silo was built with matched flooring, and that was in direct connection with an old barn I had. Afterwards I built a silo and this is ten by sixteen feet and twenty-five feet deep. It runs clear down through into the basement. The basement of the stable is eight feet high and is surrounded by the sills of the barn and the cross pieces, and I have no trouble at all. I used it as a feed for horses for two or three years, but we do not confine our horses to that alone. Horses like it. We are keeping four horses and we give them a half a bushel night and morning. Two years ago, my boy, in a dicker, got an old mare that had the heaves very severely, and he confined her almost entirely to ensilage, and after a short time the heaves entirely disappeared, but when we returned to feeding dry feed to her, of course, it came back; but I wanted to state, that in feeding ensilage to her, we relieved that heaving. I suppose it was because it was damp feed, and it didn't choke or fill her up.

Professor Noyes: I would say, the modern silo of Wisconsin is a round silo, built thirty feet high, and being round, as it is, and that height, they get a greater pressure and the fodder packs more evenly. I would say, in regard to feeding stock cattle or fat cattle, ensilage fed rightly is splendid for either. But understand that stock fed on this ensilage must be kept warm, and it is quite essential that the weather should be warm. They should not be turned out in the cold weather.

Mr. L. P. Bailey: In regard to what Professor Noyes has said, I know of a gentleman in Parkersburg, West Virginia, who had his barn burned down a year ago, when the thermometer was down to zero, and he turned out thirty head of cattle in that weather, in that exposed condition, and the bulk of his silage was left there when the barn was burned, which happened on the first of January, and those cattle ran out on the hillsides, and he carried ensilage out and fed those young cattle, and, during the whole winter had no other shed for them. As you all remember, that was one of the coldest winters we have had in this country for some years, and I saw his cattle in the latter part of March and they came out in good shape. Therefore those cattle were not injured very seriously by being exposed to the weather or being fed on ensilage during that winter.

Now, in regard to running a silo; I have four silos. I have a square silo, a round cornered silo and I have a perfectly round silo. I built a cheap silo at one time; I used two by eight pieces around, horizon

tally, and then I got a three-foot circle and put into the corners, and that is lined with pine, and that is all there is to it. That old silo has no outside; it has no weather boarding on the outside; that cost about a dollar a ton—capacity. The first silo I built was in my barn. It was thirty feet deep and the timbers very heavy. This silo was twenty-two by twenty feet and yet the sill, twelve by fourteen inches, sprung out, and the consequence was that I had to run a partition through and run rods through to draw it together the next year.

The last silo I built is a perfectly round silo, thirty-two feet deep and twenty feet in diameter. I believe that is the way to build a silo, and it is the cheapest way in which a silo can be built successfully. I used two by four inch studding, and on the inside I took six-inch weather boarding, inch stuff split in two, and lapped right around on the inside of the studding. My studs are sixteen inches apart, and then lining is wrapped around and then we put on a coat of building paper, then we mark where the boards join together on the paper, and then put on the inside lining another lining of weather boarding and nail it thoroughly, three nails in each studding; and on the outside I run around another coat of weather boarding. That silo cost me about one dollar a ton of contents, all finished, painted inside and out. We used oil and Venetian red on the inside and white lead and oil on the outside. That is the cheapest silo we can build. I built a silo last fall and have not opened it yet, but there is not a particle of spring in it. I believe it is out of the question to build a silo with your studding up and down, and lined as you would line any other building, or running it horizontally around and lining it up and down, either way. If you build a thirty or thirty-five foot silo it is almost out of the question to get it so it will not spring out.

Now, in regard to filling the silo; our people seem to have adopted a cheap, homely plan. We take some old burlap sacks and hang on the end of a carrier, take the hoops off of an old barrel and slip them right down through each one, making them flexible and run them right down to the bottom of the silo, and all the man in the silo has to do is to carry that around. One man will fill a silo in that way and do it better than two or three can in the old way, letting it fall down.

In regard to tramping the ensilage, it is not necessary. The weight of it at the bottom is enough. It ought to be thoroughly tramped at the top.

Mr. L. R. Dunham: I suppose there are more silos in Cuyahoga county than in any other six counties in the state of Ohio. Within a mile and a half of where I live there are probably not less than twenty, and they run from ten to one hundred and fifty tons capacity, and I venture to say that to-day there would be more silos filled with ice than with ensilage, if they could get the ice. I was through a man's barnyard that joins my farm, the other day, and he has been a silo man all his life, ever since they came into existence. He has three one hundred and fifty ton

silos at his barn, and I walked through his yard the other day, and he had manure about three feet deep, and I asked him what he did that for, and he said that he had come to the conclusion that silage made better manure than it did feed.

Now, I can give you one reason why silos have gone down in Cuyahoga county, but whether it is the whole reason I cannot say. The milk producers ship their milk to the city of Cleveland, and silo men were notified last spring by the dealers, also by the city inspectors, that they would not be allowed to ship silo milk any more into the city. They gave no reason why. I have no silo myself and when I sold my milk this fall I sold it to a man who said that he would not under any consideration buy milk that was made on ensilage feed, and he bought my milk at one and one half cents a gallon more than he would have to pay for milk made of silo feed. Now, that is the condition of the silo in Cuyahoga county, and there have been lots of them that have given it up. It is very expensive, they claim, to fill them. Some years they keep and some they won't keep. If a man loses all his feed he is in bad shape, and the milk producers of the county are to-day looking for something better or for some other way to save their feed. Now, I will tell you in what line I am experimenting. I take common corn, white or yellow corn—I have tried them both—I take my grain drill and I sow it middling thick. I do not want to grow a very large stalk and I do not want to grow a very large ear. A medium stalk is plenty large and a medium ear is plenty large; then I use a McCormick corn harvester, and I take a row right along and finally get a bundle—I can set the machine so that one bundle will make just about one feed. This corn I let get good and ripe, and I have had no trouble this year or last year in taking this corn and packing it solid right in my bays. I put twenty-five acres into two bays this year, solid. Last year I didn't dare to do it. I have had no trouble and I have as nice a feed as I ever saw. My cattle never did better in the world, and I never husk it. We don't husk it; we feed it stalks, corn and all. If I have a cow, I want to put upon the market for beef, I feed the same way. This is the second year's trial I have had of it and I am well satisfied with it. Another thing; I do not feed my cows so much of this feed that they waste it, and, the stalks not being large, I want to say that in feeding about twenty-seven or twenty-eight acres last year I did not have a common wagon box load of cornstalks to haul away. I am trying this, and I think the people who have silos, and I know of one or two of them, are beginning to get a little jealous, and I think in our county we cannot find anything better than that way, and that that will soon take the place of the silo.

Professor Hickman: I want to give you about three minutes' explanation of what the gentleman has said. While I have not met him, he is doubtless a good, straightforward Cleveland man, but there is an explanation which I wish to give; and I am inclined to

make the statement that if you will go back in the history about eight or nine years, when the first silo convention was held in Cleveland, and follow it down you will find that Cleveland has become contaminated. I make that assertion for the reason that the experiment station, where we are, is making butter from the cream of several cows; we have had occasion to send that butter to Columbus, Cleveland, Buffalo and a number of other points over the country, and we have found not a single objection to any of these varieties of butter except from Cleveland, "the same old contamination of silo." I have written this fall to inquire of butter men within the region of Cleveland to know whether or not there was any objection to the milk from those parties using silos, and I learn that they have almost forbidden its coming into the town. But is there not a possibility that in that section of country they have not gotten on to the way to feed ensilage? If you will go back a little further in the history, down into the eastern part of Pennsylvania, about '79 or '80, the first thing we heard from the silo was of Philadelphia's refusing to let milk and butter, coming from the section where they used silos, come into the city. Why? For the reason that it tainted the milk and butter. Now, gentlemen, I want to ask you, if you were to allow your wives to feed you buckwheat cakes, and nothing else, from the first of December to the first of April, whether it would be possible for you to taste anything else or not? (Laughter.) Is there not possibly something in the fact that they have not learned to feed ensilage up in Cuyahoga county. I would like to know, above all things else, why it is that their tastes are so differently educated up in Cuyahoga county from all the balance of the state. And I believe if you want to get a real nice education as to taste there is the place to go to get it. Now, I should like to give you the reason of this, but I am not able to do so. But I do not want these people to go away from here and say that there is nothing in ensilage.

Mr. L. R. Dunham: Being connected with the Milk Producers' organization, I represent anywhere from three hundred to five hundred milk producers, and I know what I am talking about, and it doesn't make any difference about the tastes of the city of Cleveland or any other city. The city of Cleveland hires officers and pays them a salary for passing laws, and they impose heavy fines too, and that is our market, and if they see fit to do this I do not know where our remedy is unless we can ship all our milk to Columbus, and I do not think that we can do that. Now, I think if the legislative power of Columbus should pass the same laws these gentlemen would be in just exactly the same boat we are.

Now, I know this so far as I am concerned, and I think everybody else is in the same fix, that whenever a man goes into a barn where there is ensilage, if he is not used to it it attracts his attention immediately, and I want to say that I have tried it and can take milk and tell the

difference in drinking it. Now, I am not saying this because I am an enemy to ensilage or the silo. I would build a silo in a minute if I thought there was anything in it. But my idea is to get at the best possible results at the least expense, and get something that we can put on the markets of our cities. We have got to do it because they make us do it, and if we don't do it they won't buy. If we adulterate it they will fine us, and if the milk don't smell right they will fine us.

Mr. Mills: I would just like to say a word on this subject. I have shipped milk to Cleveland for the last thirteen years without any exception. For ten of those years I have used the silo. I have sold milk to various peddlers, and I could give a long list of names, and none of them have ever complained to me about ensilage milk. It has been to the contrary. I have received compliments for the quality of my milk. I defy any peddler in the city of Cleveland to detect ensilage milk if the cows are properly cared for, as they should be. The city inspector of Cleveland, Dr. Ashman, a few years ago was testing milk and he had had two samples sent to him to test, to determine which was ensilage and which was not ensilage milk. And the ensilage milk he said was not ensilage milk and that which was not ensilage milk he said was ensilage milk. I have milk producers right beside me who are sending milk daily into Cleveland, and are sending it to milk peddlers who won't buy of milk producers who have silos, and they are selling it to parties on Euclid avenue, and they are not always able to furnish all of the milk their peddlers want and they buy of us farmers that are feeding our cows ensilage, and they send them that milk and they don't know it.

Mr. Bailey: One point in regard to feeding ensilage to cows; I have had a little trouble along that line. Ensilage should be fed after the cows are milked and the milkers should not handle the ensilage before they milk the cows. In that way, if you have your silos built properly, I defy any man to detect the taste between the milk from dry feed and that from silage.

And thereupon, on motion, the Institute adjourned.

Thirty-fifth Annual Session
OF THE
Ohio Wool Growers' Association

Held in the Senate Chamber, Columbus,

January 13, 1897.

The meeting of the Ohio Wool Growers' Association was called to order in the senate chamber of the state house by the president, Judge Wm. Lawrence, Wednesday evening, at 8:20 o'clock, who said:

Gentlemen, I will say for your information that I have been for ten days in Washington. I made an argument before the Committee on Ways and Means in favor of the tariff bill that was agreed upon a year ago by the National Wool Growers' Association, endorsed by the Farmers' National Congress at Indianapolis, endorsed by the Ohio State Grange at Bellefontaine in November, and twice endorsed by the National Wool Growers' Association, first in December, 1896, and again on the 4th of January, when they had a meeting there.

Now, the remarks I shall make to-night I have prepared in writing, although I could make a speech on the wool tariff without any writing. I consider a part of the value of what I have to say exists in the figures I give, which are essential to an understanding of this wool tariff. As I said, I made an argument before the Ways and Means committee in favor of the wool tariff bill agreed to by the National Wool Growers' Association. And in addition to that I have a written argument the whole of which would make a book of at least one hundred pages. It goes into the question very fully, and I can say one thing for it, that it has a good many valuable statistics and information which I did not make, and therefore I can say that it is good. I suppose by writing to your members of congress, they could probably get copies of it. Anybody that chooses to order copies at the government printing office can get copies of any public document by paying for them. I secured and paid for one hundred of these at my own expense, between thirty and forty dollars, and I did the same thing with the argument. Here are two documents both of which I prepared; other gentlemen prepared other matter a good deal better. And the two documents discuss the wool tariff agreed upon in December of last year.

I went to the Farmers' National Congress at Indianapolis chiefly for the purpose of getting that congress to endorse our tariff bill and it did so. I got the State Grange at Bellefontaine at the meeting on the tenth of December to endorse it.

There is another thing that we have to consider. After we had made our arguments before the committee on Ways and Means it was suggested that if we got the eastern wool manufacturers to agree with us upon a wool tariff, it would be a very proper thing for us to do, and it was arranged to have a conference on the ninth of February. I have issued a call for a meeting of the Wool Growers' Association there, and under the constitution, we shall have at least two delegates from each association. Now, we want two delegates in addition to myself to go to Washington in reference to this business. The wool tariff of 1867, which was a sufficiently protective wool tariff, was agreed to by the wool manufacturers and the wool growers, and that was a good tariff for the conditions then existing. But I know that from that time to this the wool manufacturers have never been willing to give us a fair tariff, and if we expect to get anything like a fair tariff we have got to have the manhood to stand up and insist upon our rights. We have had no tariff since 1867 that amounted to much. The act of 1883 was a failure. Under it sheep declined in the United States. In the bill of 1890, if it had been passed as reported by Mr. McKinley, it would have done very well, but in getting it through the house the wool manufacturers of Philadelphia were the means of largely destroying its benefits. The prices of wool went down and down. We must have something better than that, not only because of the loop holes in it, but because of the conditions which have arisen since that time.

Now, I would be glad if we could find a couple of gentlemen here who would be willing to go to Washington on the ninth of February.

Mr. C. S. Chapman: While we are considering that question I would like to say to the members of the Wool Growers' Association that our chairman drafted some resolutions in regard to the death of Hon. Columbus Delano, as follows:

Whereas, the members of the Ohio Wool Growers' Association have learned with sincere regret of the demise of Hon. Columbus Delano. Therefore be it

Resolved, That this association expresses its high sense of appreciation of the great services he rendered to the people of the United States, during the many years he served as president of the National Wool Growers' Association and as president of the Ohio Wool Growers' Association, in addition to his other valuable services as one of the distinguished statesmen of the country.

Resolved, That we tender to the family of the deceased our sincere condolence and sympathy in their great bereavement, and

Resolved, That a copy of the foregoing preamble and resolutions, certified by the president and secretary of this association, be forwarded to the family of the deceased.

And thereupon, on motion, the above resolutions were unanimously adopted by the association.

ADDRESS OF THE PRESIDENT,

HON. WILLIAM LAWRENCE.

GENTLEMEN OF THE OHIO WOOL GROWERS' ASSOCIATION: We have once more assembled in annual convention to consider the condition of sheep husbandry, and what legislation by congress is needed in its behalf.

The presidential and congressional elections in 1896 resulted in favor of the general policy of a protective tariff. The platform of principles of the political party of protection promised "the most ample protection for wool." The wool tariff has been properly styled "the keystone of the protective arch." It was so regarded in the Wilson Tariff act of August 27, 1894, which abandoned the general policy of protection. The political party which will be in power after March 4, 1897, is obligated by solemn pledge to give no meager or half-way protection to the wool industry. But wool growers are now asking barely that measure of protection which is essential to reasonable prosperity for their industry.

I.

CONDITION OF SHEEP HUSBANDRY IN THE UNITED STATES 1892 TO 1894.*

In 1893 the number of sheep in the United States was 47,273,553, with an average value of \$2.66 per head, or a total of \$125,909,264, and a wool product estimated by the department of agriculture at 303,151,055, and by J. P. Truit, of Philadelphia, at 348,538,138 pounds, as marketed, generally unwashed, some washed.

The presidential and congressional elections of 1892 resulted in the election of Cleveland as president and a congress in favor of a "tariff for revenue only," with free wool, which even before a free wool law was enacted began to produce its effect in reduced prices for wool and the slaughter of flocks. The free wool bill was passed and became a law August 27, 1894.

II.

THE EFFECT OF FREE WOOL, 1892 TO 1896—GENERAL EFFECT.

Under the free wool act of August 27, 1894, sheep in the United States declined in numbers until, on April 1, 1896, they reached only 36,464,405, of the average value of \$1.70, or a total of \$61,989,488, with a wool product of only 270,474,708, of the farm value of only \$20,800,146. (Senate document No. 17, fifty-fourth congress, second session, December, 1896, pp. 143, 177, being the memorial of the Farmers' National Congress.)

This was a loss in number of sheep of 10,809,148 since 1893, a loss in value of \$63,919,776, a loss in wool clip of 78,063,430 pounds, which under adequate protection would have been of the farm value of \$13,010,571.

* References are made in this argument to documents which should be read to fully understand the points discussed; so, also, should the argument of Mr. Lawrence before the committee on Ways and Means, January 6, 1897, for which see Tariff Hearings.

The farm value of wool in 1892, with a meager tariff protection, was \$47,185,-283; the farm value in 1896, without protection, was \$20,800,000, or a decline in value from 1892 to 1896 of \$26,385,283.

Hon. S. N. D. North, secretary of the National Wool Manufacturers' Association, says: "The average farm value did not exceed 8 cents per pound" for the wools of the United States in 1896. Justice, Bateman & Co., Philadelphia wool merchants, show that the farm value of Ohio XX fine unwashed merino was, July 1, 1896, only 9 cents, and the wools of Utah and the Rocky mountain region only 4 cents. (Senate document No. 17, December, 1896, p. 25.)

It has been demonstrated that from 1892 to 1896, inclusive, the wool growers of the United States lost, by free wool, \$178,793,121. The items in detail will be found in senate document No. 17, December, 1896, pages 24, 27, 177.

2. WHAT OHIO LOST BY FREE WOOL.

In April, 1891, Ohio had 3,796,695 sheep, of the value assessed for taxation of \$10,082,076; in 1896 only 2,293,686 sheep, of the value of only \$3,897,710, a decline in numbers of 1,503,009 and in value of \$6,184,366. (Senate document No. 17, December, 1896, p. 168.)

3. WHY THE LOSS OF SHEEP WAS NOT GREATER IN ALL THE STATES.

The loss in numbers, both in Ohio and in all the states, would have been greater but for two reasons:

1. The hope that in the near future a sufficient protective tariff would soon come; and
2. Because all agricultural industries were so depressed that wool growing lived to suffer a common calamity.

III.

THE CONDITION OF FARMERS WHO OWN NO SHEEP—ALL INDUSTRIES SUFFERING.

We need, and with adequate protection can soon have, in the United States 110,000,000 sheep, producing 650,000,000 pounds of wool on the unwashed basis—all required of every kind for our annual consumption. (Senate document No. 17, December, 1895, pp. 6, 197; senate miscellaneous documents, 35, 77, 124, fifty-third congress, second session; senate document No. 17, December, 1896, p. 28. Thomas Dolan so declared, January 21, 1896.) This would make an increased demand for pasture, hay, corn and oats. With adequate protection for wool since 1883, we would now have that number. (Senate document No. 17, December, 1896, p. 29; senate miscellaneous document No. 124, fifty-second congress, second session, p. 22; senate miscellaneous document No. 77, same session, pp. 17, 24.) With that number, fair prices for corn, oats and hay would now reward the labors of the farmers of the United States. For want of them the farm value of corn in Ohio is only 18 cents per bushel; oats, 13 cents; fat cattle and hogs only \$3 to \$3.25 per 100 pounds, and until the shortage of the wheat crop of 1896 wheat in Ohio for two years commanded only 50 cents per bushel. These prices are ruinously low—a decline of about 35 per cent. in the last twenty years, while the conditions of society require new and more expensive modes of living.

In the states west of Ohio even lower prices and more depression and financial embarrassment exist. The farmers encounter bankruptcy and mortgages, and, by the "interdependence of industries," distress and ruin are invading all productive employments.

Something must be done to relieve existing conditions or the Republican party will soon go out of power; the protective policy cannot be maintained, and a revo-

lution may come in our monetary policy. (Senate document No. 17, December, 1896, pp. 30, 36, 64, 82, 130.)

The Baltimore Sun of February 6, 1897, published an extract from a recent address of that eminent merchant, philanthropist and statesman, formerly a member of congress, Hon. William E. Dodge, of New York City, at a meeting in that city, in which he said:

"I was fortunate enough to be appointed as one member of the delegation to Indianapolis, and while acting on the committee on rules and regulations, to which all the business was referred, I was shut up for two days with representatives from twenty-eight different states and I had an opportunity of free and unrestricted intercourse and conference with those gentlemen, and the information received there was confirmed afterward in Washington, where, as chairman of the arbitration committee, I had conferences with a number of senators from those same states, and I came back very deeply impressed with the conviction that I had not been entirely informed, and those living in the east were not entirely informed, as to the condition of things in very large portions of our country.

"I was surprised, sir, to find the assertion constantly made by men from the far western states and the south and southwestern states that it was not Mr. Bryan and it was not silver that they were in favor of, but they needed some change to bring relief from the terrible condition of poverty and scarcity of money under which they labored. They felt that their condition was so extreme and so painful that any change would be of value; and when I came to look into the matter and to talk in a friendly and kindly way with them, they all confirmed the same feeling which I had found in a long conversation in the treasury department at Washington, that the circulation of the country is quite out of joint, that the lungs and heart are congested, and that the extremities of the country are absolutely without any blood.

"I found that there were great sections of the southern and western country where there was absolutely no money at all; where the most primitive forms of barter obtained; where everything was most disorganized. One gentleman told me that in his county, which was quite a rich agricultural country, by some happy accident a \$50 bank bill had come down into the county and that he had taken a horse and buggy and spent four days in visiting all the towns in the county striving to get it changed into smaller bills, but had been unable to do so and finally was obliged to send it to Richmond. There were senators who told me that their constituents never saw a dollar of money from the beginning of the year to the end, with the result that they had constantly to go into debt to the local storekeepers. The local storekeepers received their pay in kind. In fact, everything was drifting back to the old times before money was invented. And this was not in one section of the country only, but in large sections.

"We can quite easily understand that where there is not sufficient money to establish a national bank under the very onerous laws at present in force, there is nothing else to take the place. The same difficulty has come up in other parts of the world.

"In this country every man has a chance to care for the government, and unless we instruct our good friends and show our sympathy with them and understand that when any part of the country suffers the whole country suffers, we are sure to have difficulty ahead. It was brought out at the Indianapolis convention that after the first sad, serious mistake made necessary by the exigencies of the civil war we had gone on with makeshifts ever since. One bit of legislation necessary to bridge us over a particular crisis has been met with another; with every issue of bonds and of greenbacks, and with every other form of currency, legislative enactments have been made and they contradict and overlap each other, and the business of the treasury is exceedingly hard and difficult.

"I came away from Indianapolis with this very firm impression, and I have only ventured to submit it because I feel it so deeply that unless those of us in more favored parts of the country understand the condition of our brothers and our fellow-citizens in the other parts of the country, unless we wisely instruct and educate them and bring about some wise methods for their relief, when the year 1900 comes we shall be swamped by an infinitely more powerful vote against us than during this last election. I think the change will be a very serious one. Every man that I met emphasized that fact. Therefore I make the motion that a committee be appointed to act with that commission, so that we can bring back to New York and to our friends here such information as may lead them to give their advice and experience and help to any wise efforts determined upon by the government. [Applause.]

"Here it is appropriate to say:

'Princes and lords may flourish, or may fade,
A breath can make them, as a breath has made:
But a bold peasantry, their country's pride,
When once destroyed can never be supplied.' "

IV.

THE GREATEST NEED A WOOL TARIFF.

The greatest need to begin the revival of ALL industries is that which was promised by the Republican national platform of 1896—"the most ample protection for wool." A wool-tariff bill, singly and alone, should be the first measure passed at an extra session of congress, because it is first in importance to begin to restore prosperity, and sheep husbandry has suffered more by hostile legislation than any other industry in our whole national existence.

V.

THE WOOLGROWERS' BILL—TWELVE CENTS DUTY—FIVE REASONS IN SUPPORT OF IT.

The National Woolgrowers' Association in December, 1895, agreed upon the draft of a bill asking for a duty of 12 cents per pound on unwashed merino. This is necessary and just.

1. This was indorsed by the Farmers' National Congress, November, 1896; by the Ohio State Grange, December, 1896; again by the National Woolgrowers' Association, December 4-7, 1896; again, January 4-5, 1897; by the Utah Woolgrowers' Association, August, 1896 (Senate Doc. No. 17, December, 1896, p. 31); by the Indiana Woolgrowers' Association, January 5-6, 1897, and by the New Mexico Woolgrowers' Association, January 23, 1897.

2. The wool-tariff act of 1867 gave a duty of from 12 to 15 cents, according to value, when foreign wool prices were *much higher than now*. (Senate Doc. No. 17, December, 1896, pp. 134, 142.) With high foreign prices less protection is needed; when they go down more protection is needed.

3. The act of 1883 gave from 10 to 12 cents per pound, according to value, when the foreign price was much more than now. But even with that protection our sheep declined in numbers from 50,626,626 in 1884, with a wool clip of 308,000,000 pounds, to only 43,431,136 in 1891, producing 285,000,000 pounds.

4. The act of 1890 gave a duty of 11 cents, but under that (1) the prices of wool went down and down. (Senate Doc. No. 17, December, 1896, pp. 25-27.) (2) Sheep in Texas actually declined in numbers from 4,281,812 in 1890 to 2,859,269 in 1894. (Senate Doc. No. 17, December, 1895, pp. 181, 209-211.) (3) The increase in the aggregate of numbers was slow and inadequate. (Senate Doc. No. 17, December, 1896, p. 144.)

HONOR TO WILLIAM MCKINLEY.

And here it is appropriate to say that William McKinley, then in congress, voted against the repeal of the wool tariff of 1867, against the reduced tariff bill of 1883 because not sufficiently protective. He had the foresight to see the ruin it would bring and the courage to withstand the plausible clamor for reduced duties. Verily, he has his reward. His example should give courage to those who now falter and to those about ready to surrender our just claims to ample protection.

The fact is woolgrowers lived on hope rather than any sufficient benefits realized. The act of 1890 was a failure by reason of defects, the effects of which were not foreseen by reason of *ad valorem* duties on third-class wools and the decline in the world's prices of wools since 1890.

5. The world's prices of wools declined from 1891 to 1895, 18 per cent., thus requiring more protection than in 1890. (Senate Doc. No. 17, December, 1896, p. 31.)

VI.

I—WHAT IS AMPLE PROTECTION FOR WOOL—HOW ASCERTAINED.

In order to determine what is ample protection we must ascertain :

1. The cost of producing wools in the United States, and,
2. The price at which foreign competing wools can be laid down at our principal wool markets, Philadelphia, New York and Boston.

COST OF PRODUCING WOOLS IN THE UNITED STATES.

The principal wools of the United States are merino. The actual cost of producing these wools, without allowances for profit, east of the Missouri River is—farm value—all of 20 cents per pound for unwashed merino, shrinking 66 $\frac{2}{3}$ per cent. in scouring.

The cost in the Rocky Mountain region is all of 16 cents per pound.

This is shown in Senate Document No. 17, Fifty-fourth Congress, first session, Memorial of National Woolgrowers' Association, December, 1895, pages 70, 107, 152-153.

In Texas, where the cost is less than in most even of the new states, the ranch price in 1890 was 18.21 cents per pound. Sheep began to decline in numbers so that in 1892, with the price 15.72 cents, the number declined to 3,564,469.

HOW SHEEP HUSBANDRY DECLINED IN TEXAS UNDER THE TARIFF ACT OF OCT. 1, 1890.

The following statistics of sheep and wool prices show the insufficiency of the act of 1890, as a protective measure for the wool industry.

TEXAS SHEEP AND WOOL STATISTICS.

STOCK.

[From official reports of Comptroller of State of Texas.]

Year.	Number of sheep.*	Valuation.	Average per head.	Increase in number.	Decrease in number.	Increase in valuation.	Decrease in valuation.
1870.....	924,749	\$992,316	\$1 07	.....	.....	.....	.....
1875.....	1,706,044	1,939,740	1 13	781,295	.....	\$947,424	.....
1880.....	2,977,618	4,282,530	1 43	1,371,574	.....	2,342,790	.....
1881.....	3,262,107	5,001,619	1 53	284,480	.....	719,080	.....
1882.....	3,771,242	7,031,789	1 86	509,135	.....	2,030,170	.....
1883.....	4,491,600	9,228,234	2 05	720,358	.....	2,196,445	.....
1884.....	4,691,008	9,291,390	1 98	199,408	.....	63,656	.....
1885.....	4,749,625	6,224,076	1 31	58,617	.....	.....	\$3,017,514
1886.....	4,543,765	5,282,814	1 16	.....	205,860	.....	941,262
1887.....	4,275,394	5,016,674	1 17	.....	268,371	.....	236,140
1888.....	4,316,513	4,636,463	1 07	41,119	.....	.....	380,211
1889.....	4,281,111	5,082,293	1 17	.....	36,402	395,830	.....
1890.....	4,281,812	5,454,310	1 27	1,701	.....	422,517	.....
1891.....	4,070,225	5,639,765	1 38	.....	.....	184,895	.....
1892.....	3,564,469	4,854,384	1 36	.....	505,756	.....	.....
1893.....	3,366,257	4,776,848	1 42	.....	198,212	.....	77,536
1894.....	2,859,269	2,761,727	97	.....	506,988	.....	2,015,121
1895.....	2,386,822	2,442,162	1 02	.....	472,447	.....	319,565

*Assessors ascertain number January of each year.

WOOL.

Price of wool per pound averaged from statistics furnished by Messrs. T. C. Frost & Co., Hill & Palmer, and Half & Bro., of San Antonio, Texas.]

Year.	Import rate.	Average price per pound.	Aver. weight of fleece.	Aggregate of clip.	Value of clip.	Increase in clip.	Decrease in clip.	Increase in value of clip.	Decrease in value of clip.
	Cents.	Cents.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
1870.....	+10	.....	5½	5,086,119	.....	.....	.....	.....	.....
1875.....	+10	.....	5½	9,383,242	.....	4,297,123	.....	.....	.....
1880.....	+10	.....	5½	17,121,303	.....	7,738,061	.....	.....	.....
1881.....	+10	.....	5½	18,757,114	.....	1,635,811	.....	.....	.....
1882.....	+10	.....	5½	21,684,641	.....	2,927,527	.....	.....	.....
1883.....	.....	17.93	5½	25,826,700	\$4,630,727	4,142,059	.....	.....	.....
1884.....	10	13.12	5½	26,973,296	3,538,896	1,146,596	.....	.....	\$1,091,831
1885.....	10	16.27	5½	27,310,343	4,443,392	337,047	.....	\$904,496	.....
1886.....	10	18.15	6½	29,534,472	5,360,506	2,224,129	.....	917,114	.....
1887.....	10	15.97	.....	27,790,061	4,438,072	.....	1,744,411	.....	922,434
1888.....	10	16.20	.....	28,057,334	4,545,288	267,273	.....	107,216	.....
1889.....	10	18.40	.....	27,820,721	5,119,012	.....	236,613	573,724	.....
1890.....	11	18.21	.....	27,831,778	5,068,166	11,057	.....	.....	50,846
1891.....	11	17	7	28,491,575	4,843,567	659,797	.....	.....	224,599
1892.....	11	15.72	.....	24,951,283	3,922,341	.....	3,540,292	.....	921,226
1893.....	11	9.82	.....	23,563,799	2,223,965	.....	1,387,484	.....	1,698,376
1894.....	Free.	7.44	.....	20,014,883	1,489,107	.....	3,548,916	.....	734,858
1895.....	Free.	7.89	.....	16,707,754	1,318,241	.....	3,307,129	.....	170,866

+Special, and 11 per cent ad valorem.

In other states under that act the increase was slow, not at all what it would have been under the most ample protection. (Senate Doc. No. 17, December, 1896, pp. 144, 148; Senate Doc. No. 17, December, 1895, p. 144.)

2. COMPETING WOOLS.

The wools east of the Missouri are generally superior in quality to those west, and the farm value of the former unwashed is accordingly about from 3 to 5 cents per pound greater. (Senate Doc. No. 17, December, 1896, p. 27.)

The Port Phillip Australian merino is more nearly of the quality of the merino grown east of the Missouri river, and is usually called the "competing wool." When unwashed and even unskirted the good grades will shrink in scouring only 50 per cent. But all foreign wools of every kind compete with *all* our American wools. (Senate Doc. No. 17, December, 1896, p. 157.)

The merino wools of the Cape of Good Hope and of Argentina are inferior in quality to the Australian, and hence are called "competing wools" for those grown west of the Missouri river, though in fact all foreign wools of every kind compete with them also. (Senate Doc. No. 17, December, 1896, p. 155.)

3. THE PRICE AT WHICH FOREIGN WOOLS CAN BE LAID DOWN IN BOSTON SHOWS THE JUSTICE OF A 12 CENT DUTY. FOREIGN WOOLS COMPETING WITH OUR FAR-WEST WOOLS.

The London Wool Circular of Helmuth, Schwartze & Co., December, 1894, quotes London prices per pound as follows: (Senate Doc. No. 17, December, 1896, p. 141.)

	pence. cts.
Buenos Ayres average greasy (36 per cent. yield).....	4½=9
Buenos Ayres average greasy (old 30 per cent. basis).....	3½=7½
This makes the average price in London	4½=8½
Average cost in Boston.....	8½

This is the competition which the merino wools west of the Missouri must encounter. It will cost an average of 3 cents per pound, including commissions, etc., to ship these far-west wools to Boston, which in competition with the foreign wool at 8½ cents will make the ranch price per pound, without tariff benefit, 5½ cents (Senate Doc. No. 17, Fifty-fourth Congress, first session, December, 1895, pp. 50, 54, 70, 175.)

But a part of the Buenos Ayres wool quoted yields 36 per cent. clean wool, which is from 3 to 6 per cent more than much of the wools west of the Missouri. And, first, by reason of this, and second, the fact that the lightest of the foreign wools will be imported, and, third, that some advantage should be given to our wool over the foreign, there should be deducted 1½ cents.

This will leave the net ranch price 5 cents.

The correctness of this is shown by the fact that Justice, Bateman & Co. quote the ranch price, July 1, 1896, at 4 cents, under free wool. (Senate Doc. No. 17, December, 1896, p. 27.) A tariff rate of 12 cents per pound will never give a "protective benefit" equal to the tariff rate. But suppose it gives a protective benefit of 10 cents?

This would give the price the far-west wool growers would receive actual ranch value—the price at the nearest local market—per pound only 15 cents, with a duty of 12 cents.

This computation is on price quotations of 1894, in London. But South American wool can be laid down in Boston as cheaply as in London.

I have used the price quotations for 1894, because they fairly represent those we

may expect to encounter under a new tariff. This is evident, from the following considerations:

1. Whenever a new tariff shall come foreign wool will *decline in price* (1) in order to get into our markets and (2) because of the competition by the increase of our flocks.

This we may know (1) from experience, and (2) it may be inferred from the evidence of Mauger & Avery, New York wool importers. (Senate Doc. No. 17, December, 1896, p. 64.)

2. Theodore Justice, in a letter January 27, 1897, says:

"In my judgment, before another presidential election Port Phillip (Australian merino) will fall 6 cents per pound. (And see Justice, Batemen & Co., wool circular, February 1, 1897.)"

3. The secretary of the National Association of Wool Manufacturers said, in the bulletin of the association for September, 1896:

"Cheap as is domestic wool to-day, it is not as cheap, when all the conditions of shrinkage are taken into account, as many of the foreign wools which are now everywhere to be found in our markets. *As the pressure of these foreign wools increases*, the prices of domestic wools are destined to *fall still lower*, in comparison with foreign prices. This is proved by the fact that they cannot now be profitably shipped abroad for sale in competition with foreign wools."

The reason there is an overproduction of wools in the world. (Senate Doc. No. 17, December, 1896, pp. 31, 100.)

The secretary of the National Association of Wool Manufacturers, in the bulletin of the Association for September, 1896, says:

"That the world's production of wool has doubled since 1870, and that the demand for it has been steadily lagging behind this enormous increase in supply."

4. And it will be seen by the evidence of our late Consul General Wallace to Australia that Port Phillip, (Australian) merino, *very much superior in quality* to the *general* South American and Cape of Good Hope merino, can be produced at a price of nine cents per pound, whole fleeces, on shipboard at Melbourne, and laid down in Boston for ten cents. The conclusion is that there is a certainty that American woolgrowers will encounter even lower prices than those of 1894, and hence need *more protection*.

But if we take the prices of South American merino wools in 1896, the woolgrowers west of the Missouri need a duty of 12 cents per pound on merino. These wools can be laid down in Boston as cheaply as in Liverpool. Prices in 1896 were advanced somewhat over 1894 because importers and manufacturers were buying foreign wools largely to hold for an advance in the American price under the expected wool tariff of 1897. (Senate Doc. No. 17, December, 1896, pp. 31, 152.)

But, as already shown, when the tariff shall come the foreign prices of foreign wools will decline.

The Liverpool Wool Circular, December 19, 1896, of J. L. Bowes & Bro., quotes as follows:

	Pence.	Cents.
Montevideo, merino unwashed, per pound, good average	6½	= 13
Lima, unwashed, average.....	5½	= 11
The average of the two would be.....		12
Allow 3 cents for cost of shipping wool from the Rocky mountain region to eastern wool markets.....		3
Leaves ranch value only.....		9

But the wool quoted for our markets (*such as will be imported under a tariff*) is "good average" and "average" which is lighter than the *total average* of our merino wool west of the Missouri river, and will command in our markets all of 3 cents per

pound more than our far-west wools. This will reduce our ranch price to 6 cents per pound. If a duty of 12 cents gave a protective benefit of that amount—as it will not—the ranch price would only be 18 cents—in practice only 16 cents at most. And as we have seen, when the ranch price in Texas fell as low as 18 cents per pound, sheep began to decline in numbers.

The conclusion is inevitable that the woolgrowers west of the Missouri need a duty of all of 12 cents per unwashed pound of merino.

ADDITIONAL EVIDENCE—FOREIGN MERINO WOOLS COMPETING WITH THE MERINO
GROWN WEST OF THE MISSOURI RIVER—NECESSITY
OF A DUTY OF TWELVE CENTS PER
UNWASHED POUND.

The treasury department report on wool and manufactures of wool (1894, p. 562) gives London prices of wool as follows:

Cape of Good Hope.	Scoured.	Spout- washed fleece.	Grease.
	<i>d. Cts.</i>	<i>d. Cts.</i>	<i>d. Cts.</i>
April, 1886.....	13 —26	8½—17	5½—11
October, 1892.....	13½—27	8 —16	5½—11
October-December, 1893.....	14 —28	8 —16	5½—11
Average.....	13½—27	8 1-6—16¾	5½—11

If a duty of 36 cents per scoured pound be added, the price per scoured pound will be 63 cents; add freight and charges from London to Boston, 1 cent, and the Boston price per scoured pound will be 64 cents.

Allowing 3 pounds of the unwashed merino wools of Texas and the Rocky Mountain region to make a scoured pound, this would make the Boston price 21 cents; allowing 3 cents per pound freight and charges from ranch to Boston would leave ranch price 18 cents.

But there are three considerations to be noticed in this connection:

- (1) These quoted prices are higher than those now prevailing.
- (2) The prospective decline, to be a permanent reduction in the world's prices of 5 cents under a tariff, will reduce the ranch price to 13 cents.
- (3) It is apparent, also, from an inspection of the prices of grease wool as compared with scoured that the *lightest* of the grease wools have been and will be imported, and that the grease wools will not shrink 66⅔ per cent. in scouring, because the average grease price quoted is 11 cents per pound and that of the scoured 27 cents, so that there is an advantage to the importer by importing the grease wool rather than the scoured, which will by so much reduce the ranch price of our far-west merino wools.

PORT PHILLIP AUSTRALIAN MERINO COMPETING WITH THE MERINO GROWN EAST
OF THE MISSOURI RIVER.

The London Wool Circular of Helmuth, Schwartz & Co., December, 1896, quotes "Port Phillip average to good scoured" and "skirted" at 28 cents per pound. The letter of Theodore Justice, March 5, 1894, shows that scoured Port Phillip was then London price, skirted, only 30 cents per pound. (See the evidence, Senate Mis. Doc. No. 124, Fifty-third Congress, second session, p. 101).

And *this* will sell in Boston for (scoured) all of 6 cents or more per pound than average scoured Ohio Merino. (Senate Mis. Doc. No. 124, Fifty-third Congress, second session, p. 101). The secretary of the National Association of Wool Manu-

facturers, in the bulletin of the Association for September, 1896, says of Ohio XX wool:

"The 1896 price is about $4\frac{1}{2}$ cents below the London scoured price of the like grades of Australian wool."

It has been shown that the UNWASHED skirted Australian will sell from 5 to 7 cents more than Ohio WASHED merino. (Senate Doc. No 17, December, 1896, pp. 41, 64, 72, 127).

This scoured Australian can be laid down in Boston for one cent per pound, but call it $1\frac{1}{2}$ cents, and this makes the Boston price per scoured pound $29\frac{1}{2}$ cents. But call it 30 cents. This is the competition to which the merino wools east of the Missouri river are subjected now, under present conditions.

THE COST OF PRODUCING AUSTRALIAN, ARGENTINE AND CAPE MERINO.

Hon. George H. Wallace, United States consul general to Melbourne under the administration of President Harrison, shows that Australian merino "skirted" wools can be put on shipboard at Melbourne for 12 cents per pound, and that whole fleeces can be placed on shipboard for 9 cents per pound. His statement is quoted in full in my argument before the Committee on Ways and Means, January 6, 1897; Quarterly Bulletin of the National Wool Growers' Association, Boston, January 1, 1897. To the same effect see special consular report to the Department of State, 1892, on "Australian sheep and wool," page 37. And this wool will shrink in scouring only 50 per cent.

This is the competition Ohio and similar wools must encounter—scoured and skirted foreign wools laid down in Boston at less than 30 cents per pound.

I do not say that Australian merino has *yet* sold as low as stated by Consul General Wallace; but it will sell as low, or possibly lower, if necessary to get into our markets under a tariff. And as already stated Port Phillip scoured and skirted wool has been quoted in London at 28 cents per pound, which proves the statement of Consul General Wallace to be correct.

CONCLUSIVE EVIDENCE OF THE NEED OF TWELVE CENTS DUTY.

With the foregoing data, the conclusion is inevitable that a duty of 12 cents per pound is not only just and necessary, but moderate.

It will require three pounds of Ohio and similar unwashed merino to make 1 scoured pound. It will cost 3 cents per pound to reach the Boston market, including (1) local wool buyers' profit; (2) freight; (3) Eastern commission merchant charges; (4) insurance, etc., making for 3 pounds 9 cents.

Here, then, are 9 cents to be deducted from the Boston value of 1 pound of scoured Port Phillip, leaving the farm value of each unwashed pound of Ohio merino, shrinking $66\frac{2}{3}$ per cent. in scouring, without tariff benefit, 7 cents per pound; but call it 9 cents.

If a tariff of 12 cents would give a protective benefit of that amount—as it will not—this would make the farm value per pound of unwashed merino 19 cents.

Justice, Bateman & Co. quoted farm value July 1, 1896, without tariff, at 9 cents, and a "protective benefit" of 12 cents would make it 21 cents. It is safe to say that with a wool tariff of 12 cents per pound the farm value in Ohio and other states east of the Missouri would reach only about 20 cents per pound.

It is well known that for Port Phillip merino, though of less intrinsic value than Ohio, yet by reason of its soft condition and its luster, fashion has made a demand which makes it command in the market, even unskirted, from 2 to 3 cents per pound more than Ohio, leaving farm value only 19 cents; and under a tariff foreign wool prices would be reduced to get into our market. If *fashion* requires foreign wool as a foreign luxury, those who indulge in the luxury of foreign fashion should pay a luxurious duty.

Some professed woolgrowers' journals object to a duty levied on the ground of *foreign luxury*. To this objection there are two answers:

1. All great statesmen agree that foreign luxuries should pay heavy duties, and
2. The duties proposed are not of this order, but only *moderate protective* duties.

At the conference February 10, 1897, between the committee of the National Association of Wool Manufacturers and the committee of the National Association of Woolgrowers, it was stated that Australian Port Phillip merino, without reference to its skirted condition, would command 2 cents or more per pound more than Ohio merino, because the former makes a *softer* cloth required by fashion, and that was not controverted. This fact reduces the protective benefit of a tariff.

THE CONCLUSION IS INEVITABLE that the duty of 12 cents per pound, in view of present and prospective conditions, is only moderate protection—very moderate.

ADDITIONAL EVIDENCE—PORT PHILLIP AUSTRALIAN MERINO COMPETING WITH THE
MERINO GROWN EAST OF THE MISSOURI RIVER—NECESSITY OF A
DUTY OF 12 CENTS PER UNWASHED POUND.

The Treasury Department Report on Wool and Manufacture of Wool, 1894 (House Mis. Doc. No. 94, second session, Fifty-second Congress, p. 562), gives the London prices of wools as quoted by Weideler & Co., wool brokers as follows:

Port Phillip.	Scoured.	Fleece.	Grease.
	<i>d. cts.</i>	<i>d. cts.</i>	<i>d. cts.</i>
April, 1883	16 = 32	11½ = 23	11½ = 23
October, 1892	16½ = 33	13 = 26	11 = 22
July, October and December, 1893	17 = 34	13 = 26	9 = 18
Average	16½ = 33	13 = 26	10½ = 21

Fleece wools are wools washed on the sheep's back, frequently "spout" washed, and they may, of course, be skirted.

If a duty of 36 cents per scoured pound be added, the price per scoured pound will be 69 cents; add freight and charges from London, 1 cent, and the Boston price per scoured pound will be 70 cents.

Allowing 3 pounds Ohio and similar unwashed merino to make a scoured pound, this would make the Boston price per unwashed pound 23 cents. Allowing 3 cents for freight and charges for each pound from the farm to Boston would leave the farm value only 20 cents. Here, again, several points are to be noted:

1. These prices, as already shown, are higher than those quoted by Helmuth, Schwartze & Co.

2. The prospective decline of 5 cents per pound under a new tariff would leave the farm value only 15 cents per pound.

3. This proves the necessity of a tariff of 12 cents per unwashed pound, even allowing that 3 pounds unwashed Ohio merino would sell in Boston for as much as one scoured pound of Port Phillip. But it will not. The Port Phillip will command more, because (1) its value is enhanced by skirting, leaving the most valuable part of the fleece, and (2) by saving the cost of scouring and in part the cost of "sorting," to say nothing (3) of the preference given to it otherwise over our American merino.

4. But there is another view: The scoured Port Phillip will not be imported

because it will be cheaper to import the grease merino (unwashed), at a single duty of 12 cents per pound, unless it be classed, as the woolgrowers' bill proposes, as washed, with a duty of 24 cents, by reason of its light shrinkage.

5. And it will be seen from the quoted prices that 2 pounds of the grease will *make more than 1 pound* scoured, and this is additional evidence of the *absolute necessity of classifying it as washed*.

6. Finally, the Port Phillip wool, by reason of its luster and its quality to produce a softer cloth than Ohio merino, will without reference to its skirted condition, sell for at least 2 cents per pound more than Ohio merino.

ADDITIONAL EVIDENCE.

[From Senate Mis. Doc. No. 124, Fifty-third Congress, second session, p. 101, March 21, 1894.]

MR. CHAS. BURDETT HART, Wheeling Intelligencer, Wheeling, W. Va.

DEAR SIR: Yours of the 28th ultimo is received. I have just had time to read the letter of Mr. Welles in the Wheeling Register. He was evidently *unfamiliar* with the subject which he discusses, and, like Congressman Springer of Illinois, *selects such figures for American wool as are nearest to figures abroad in order that he may make such comparisons as please him, utterly regardless of the fact that the wools which he is comparing are not of the same kind and quality nor of the same value*.

The London price for scoured [unwashed] merino, a wool of a No. 60's quality, is quoted in London to-day at 8 pence, or 16c., shrinking 50 per cent. It has the skirts and bellies trimmed off and is about such wool as XX Ohio and about such wool as would make a No. 60 top like the sample of top on exhibition in the office of the "Intelligencer." This No. 60's top can be bought in England at from 35c. to 37c. To make top like the sample at this price, skirted, scoured wool must be bought at 5c. less than the price of tops. In other words, scoured, skirted XX wool must be bought in the free-trade markets of the world at from 30c. to 32c.

Now, XX Ohio and West Virginia washed fleece, to sell scoured at from 30 to 32c., would have to bring not over 15 or 16c. in the fleece. It would cost all of 5c. per pound to-day to ship it from West Virginia farms to the London market, and if its value in London is from 15 to 16c., the price on the farm would be not over 11c. for such wool as for many years brought an average of 30c. on the farm during the happy period before Grover Cleveland disturbed the American wool market by his efforts to destroy the wool industry of the United States.

There is unlimited opportunity for woolgrowers to ascertain the accuracy of the above quotations in the London market by sending some trial shipments to that market.

Any man that knows anything about wool knows that Ohio and West Virginia [washed] fleeces previous to 1860 were lighter than the wools produced during the past ten years, and the average shrinkage previous to 1860 was under 40 per cent., while the average shrinkage since 1890 has been in the neighborhood of 53 per cent., and when Mr. Welles undertakes to prove that [washed] wools previous to 1860 wasted over 50 per cent, as is the case since 1890, he exposes his utter ignorance on the subject of the condition of wool then and now.

If he would consult the Hon. John McDowell, of Washington, he will find that previous to 1860 washed fine wool shrank 12 or 15 per cent. less than the same grades of 1893. The actual scoured wool in the fleece is all that has value for comparison, and not the grease that goes down the stream.

Nevertheless, the fact remains that American scoured merino wool on March 1, 1893, was only 12½ per cent. lower than the same grade of wool averaged from 1846 to 1860, and foreign wool of the same kind and quality was over 46 per cent. lower

in 1893 than its value in the London market previous to 1860, and this difference in favor of the American farmer was wholly owing to protection.

Yours truly,

THEODORE JUSTICE.

PHILADELPHIA, March 5, 1894.

These are the lowest prices on record to that time, but the prospect is for *lower prices in future*—the reduction of 5 cents per pound on unwashed merino.

This proves:

1. That in 1894 scoured Australian merino sold in London for 30 to 32 cents per pound, equal to 31 to 33 in Boston without tariff.
2. That Ohio XX unwashed merino must sell in Boston at 15 or 16 cents, giving farm value only 12 or 13 cents, in competition with Australian without tariff.
3. That a duty of 12 cents on unwashed merino, shrinking 66 $\frac{2}{3}$ per cent. in scouring, would only make the farm value of washed 24 or 25 cents.
4. That the *average* American merino is not XX, and the farm value of the average washed would not exceed 22 cents under a duty of 12 cents.
5. That as 2 pounds of Australian skirted merino will make a scoured pound, whereas it will require 3 pounds of American, our American washed merino in competition with Australian would only receive a protective benefit at most of 8 cents per pound from a duty of 12 cents even if the scoured Australian would command no more price than the American scoured, as it would.
6. The prospective but *certain* decline of 5 cents per pound in the world's price of unwashed merino would make the price of Ohio unwashed only about 8 cents per pound, thus showing the necessity of classifying Port Phillip unwashed as washed.

WHY BASE A TARIFF ON THE LOWEST QUOTATION?

The lowest quoted prices have been taken as a basis for a tariff, because—

1. Consul General Wallace has shown that Port Phillip skirted merino, shrinking about 50 per cent. in scouring, *can* be put on shipboard at Melbourne for 12 cents per pound, laid down in Boston for about 13 $\frac{1}{2}$ cents or less; and
2. Under a tariff the foreign price will come down to the lowest possible price of production to secure our markets.

Thus the wool circular of Justice, Bateman & Co., February 1, 1897, says:

"If there was any guaranty that the present prices of foreign wools would be maintained a duty of 9 cents per pound would probably approach a figure that would be satisfactory to all but woolgrowers; but as the best class of skirted Australian wools on at least two occasions within the past eleven years have been 6 cents per pound below the present price, and will in all probability soon be that low again after the reimposition of a tariff upon wool, 6 cents of the 9 cents tariff would soon be offset by the foreign decline. The American grower would then have an average of but 3 cents per pound more than the present prices for his wool. Therefore, while a duty of 9 cents would be ample at the start, a permanent duty of 9 cents per pound would, in our opinion, be insufficient."

This statement is the more valuable because Theodore Justice, of this firm, appeared before the Committee on Ways and Means, urging duties much lower than those deemed absolutely necessary by wool growers.

It follows that without *this* or *some sufficient additional tariff* on skirted unwashed Port Phillip merino, a duty of 12 cents per unwashed pound will be wholly inadequate.

There should be at least duties in addition to 12 cents on *this* wool:

1. Five cents per pound if skirted. I know it has been said that skirting adds but 5 per cent to the value of wool. But this is a palpable error—(1) It saves chiefly

the cost of sorting $\frac{1}{3}$ of a cent per pound; (2) it adds to the value by rejecting inferior parts of the fleece; (3) the statement of Consul Wallace shows that it adds at least 3 cents to the value; and

2. By reason of its lighter shrinkage than other merino wools of the world, such reasonable addition should be made as would place it on an equality with such other wools. An addition of 5 cents per pound on skirted wool would in part cover this.

In this mode a duty of 12 cents per pound can and should be made to mean and have the effect of a "protective benefit" of 12 cents.

A REMARKABLE FACT.

In this connection there is one remarkable fact which should be kept in mind: not one of the woolgrowers, or wool manufacturers, or others who oppose the rates of duty asked for by woolgrowers, give any computation showing the reasons for the lower duties they advocated. Why this absence of facts and figures? Theories, guesses, dogmatic conclusions, are entitled to no weight. Figures cannot lie and I have given the figures. Let those who insist on lower duties give facts, figures, reasons.

VII.

WHY ALL THE WOOL-TARIFF ACTS GAVE DOUBLE DUTY ON WASHED MERINO AND TREBLE ON SCOURED.

1. The wool tariff act of 1867 gave a duty of about 13 cents per pound on unwashed merino; 26 cents on washed, and 39 cents on scoured.

The act of 1883 gave a duty of 10 cents on unwashed, 20 cents on washed, and 30 cents on scoured, and some wools of larger value 12, 24, and 36 cents. (Senate Doc. No. 17, December, 1896, p. 123.)

These duties were given because the real value of wool as shorn from the sheep in the grease, unwashed, depends on the clean or scoured product, and the general average of the merino wools of the world will shrink in scouring $66\frac{2}{3}$ per cent. leaving clean wool $33\frac{1}{3}$ per cent. (Senate Doc. No. 17, December, 1896, p. 122.) The duty was based on the theory that the unwashed fleece would shrink in washing $33\frac{1}{3}$ per cent., and in scouring $66\frac{2}{3}$ per cent. The shrinkage in washing will depend on its extent, but the general result is as stated, and certainly only $33\frac{1}{3}$ per cent of scoured wool.

The McKinley Act of 1890 gave a duty of 11 cents per pound on unwashed merino, 22 cents on washed, and 33 on scoured. Its purpose was to give a "protective benefit" of 11, 22 and 33 cents—that is, to enhance the price of our American merino by so much over the price at which foreign competing wools could be laid down in Boston.

But the act of 1890 was fast becoming a failure as a protective measure for reasons—

1. The decline in the world's prices of wools of 18 per cent from 1891 to 1895, a result not foreseen, but now requiring increased duties. (Senate Doc. No. 17, December, 1896, p. 31.)

2. The *ad valorem* duties on third class wools.

The bill as reported by Mr. McKinley provided for *specific duties* on all wools, a duty of 8 cents per pound on the better kinds of third class wools, but against his views and against the wishes of woolgrowers the ruinous *ad valorem* duties were inserted.

3. A third defect was the "skirting clause," the effect of which was not generally understood by woolgrowers or in congress (Senate Doc. No. 17, December, 1896, pp. 72, 129, 155, 40-42; Senate Doc. No. 17, December, 1895, pp. 45-54, 60-71, 83, 137, 150-154, and introduction, pp. I-III).

SKIRTING TO DEFRAUD THE TARIFF.

In 1867 the process of "skirting" fleeces—cutting off the belly, britch and other inferior portions so as to make the skirted portion more valuable and salable—was unknown. It is a modern invention to defeat in part the protective benefit of the tariff and to save the cost of "sorting" in the United States.

This process is now practiced in Australia for all wool for market in the United States, but it has as yet been introduced in South America only to a limited extent.

The tariff acts of 1867 and 1883 made no provisions on the subject of skirting because it was not foreseen by congress, if by others, that such a contrivance would be resorted to in fraud of the law. When the McKinley bill was before congress it contained a provision to prevent sundry frauds on the law, including that of "skirting," but a few wool manufacturers succeeded in securing a proviso excepting skirted wools from its operation.

The bill which now has the sanction of the woolgrowers omits the skirting clause—that is, it requires an increase of duty on skirted wools.

The extent of the increase may be a fair subject of debate; that is, for the skirting alone. On that I am ready to meet manufacturers and confer and agree on a just increase if congress will insist on permitting skirting. It adds to the value of the skirted fleece in two respects:

1. By *leaving for import* into the United States the most valuable part of the fleece (1), the *finer*, and (2) the lighter portions, the spine and rib wool, adding thereby 3 cents per pound or more to the value. This is shown by ex-United States Consul General Wallace. (See Bulletin of the National Wool Growers' Association January, 1897, p. 19.)

2. In a large measure it saves the cost of "sorting."

And by just so much as the value of the imported part of a fleece is increased by "skirting," by just so much is the "protective benefit" of a tariff reduced; that is, all of 3 cents per unwashed pound.

3. The Australian has an advantage of 2 cents per pound because it makes a softer cloth than Ohio and similar American merino.

WHAT IS "SORTING?"

What is "sorting?" Each fleece consists of from five to eight or more varieties of wool. These varieties are *sorted*, separated, and each sort is used for making a different style of goods. The process requires *high skill* and is expensive. With the skirting as now practiced, leaving only about half the fleece, or possibly a little more, the sorting is nearly complete, which, with the less cost of scouring thereby secured, adds about 1 cent to each pound of merino wool. (Senate Doc. No. 17, December, 1896, pp. 40-42, 129, 155; Senate Doc. No. 17, December, 1895, pp. 46-47 54, 69, 164-167.)

FOREIGN SORTING ROBS AMERICAN LABOR.

American wool sorters should be protected in their right to American wages for sorting all imported wool. Why import this foreign labor to the ruin of the toilers of our own cities? A million dollars annually—yes more than twice that sum—will be paid to foreign wool sorters if foreign sorting be permitted. Why not protect the 10,000 wool sorters of the United States?

John Ridgeway, a Philadelphia wool sorter, made an argument before the committee on ways and means on this subject. He was right. (Senate Doc. No. 17, December, 1896, pp. 40-42, 129, 155.) Why pay American gold to foreign wool sorters?

A MISTAKEN IDEA.

Many wool growers have been led to believe that the "skirting" of Australian wool was the chief injury to our wool industry from the wools of Australasia. (1) This is an error—the *greatest injury* is the advantage the Australian merino had under the act of 1890 over all other merino wools of the world by reason of its light shrinkage. (Senate Doc. No. 17, December, 1896, pp. 33, 36, 40-41, 122, 127.)

(2 In addition to this its peculiar luster or quality in producing a softer cloth than Ohio merino adds to its selling price all of 2 cents per pound and this is so much of a reduction in the protective benefit of a protective tariff.

VIII.

A PECULIARITY OF AUSTRALIAN MERINO—HOW IT REDUCES TARIFF BENEFIT.

The Australian merino has a peculiarity not found in any other of the merino wools of any other country, except in rare instances. By reason of climate conditions, the Australian wool is so light and clean that the better grades even unwashed and unskirted will shrink in scouring only 50 per cent.—certainly such as would be imported under a tariff—always the lightest. The result is that unwashed, unskirted Port Phillip Australian merino is lighter, cleaner, and will command in Boston a little more than the washed merino grown east of the Missouri River, and by reason of its superior quality considerable more than the merino grown west of that river.

Mauger & Avery, eminent wool importers of New York, have demonstrated that on July 1, 1893, when the New York price of Ohio washed merino was 24 cents per pound, and Port Phillip good average grease unwashed in London 18 cents, the McKinley duty of 11 cents only gave a protective benefit of 6 cents per pound to Ohio washed merino, shrinking 55 per cent. in scouring, in competition with Port Phillip unwashed. Thus the McKinley tariff, which was intended to give 22 cents protection on Ohio washed wool, only gave 6 cents. (Senate Doc. No. 17, December, 1896, pp. 33, 36, 40-41, 63, 122, 127. Per Gov. Rich, Senate Mis. Doc. No. 35, Fifty-third Congress, second session, p. 321).

Here is what was said by Hon. John T. Rich, Governor of Michigan, in an address to the National Wool Growers' Association at Chicago, September 28, 1893:

"The Fifty-first Congress (1890) enacted a law which was intended to give raw wool a fair measure of protection against foreign competition. Like the race between the safe manufacturers and the burglars is the race between tariff lawmakers and tariff lawbreakers, and it takes some years after any new law is passed before it is finally settled by department decisions just what the law really provides. So far as the fine wool interests are concerned what is known as the "*skirting clause*" has proven to be the weakest part of the fence. Section 383 carefully provides against the sorting of wool to avoid the duty, but after having done this a proviso is inserted "that skirted wools as now imported are hereby excepted." The effect of this proviso is to let in wool worth quite as much as Ohio washed fleece at a duty of only 11 cents per pound, when, if it came in whole fleeces, washed, it would pay 22 cents per pound."

ON FINE WOOL THE LAW AS IN OPERATION ONLY GIVES HALF THE PROTECTION IT INTENDED.

"So that on fine wool there is little, if any, more than one-half the protection provided by law. Another thing which helps to wipe out a portion of this is the fact that in Australia much larger flocks are kept and it is much easier to get a large amount of uniform quality, and as the wool is skirted the manufacturers buy only such wool as they need. I have myself seen in Philadelphia invoices of this

grease wool free from any hay seed or other vegetable matter, uniform in quality' with no twine, and which paid only 11 cents per pound duty and which was sold at from 40 to 42 cents when the best unwashed full-blood merino wool would bring 18 to 20 cents. The effect of the skirting clause in the law as far as the conclusions are concerned is the result of my own observation. In June, 1892, in a reply to a request from Senator Aldrich, Messrs. Mauger & Avery, of Boston and New York, estimated that fine Ohio fleece wool, washed, has an actual protection of 11.8 cents per pound, though the law provides that washed wool shall pay a duty of 22 cents per pound. On July 24, 1893, Mr. S. N. D. North, secretary of the National Association of Wool Manufacturers, addressed a letter to Messrs. Mauger & Avery, calling attention to their letter of June 6, 1892, and asking them to compute the protection on domestic wool on the basis of the then present prices. In the reply precisely the same course of reasoning is followed, and the conclusion reached is that fine Ohio washed has a protection of 6 cents instead of 22, as provided by law, and 11.8 in June, 1892. (See Boston Bulletin National Association of Wool Manufacturers, September, 1893, pp. 252-260)."

And as a consequence of this the merino unwashed wools of Argentina, shrinking like Ohio $66\frac{2}{3}$ per cent. in scouring, were excluded from our market, and Australia monopolized substantially our whole market. This is shown by the report of our consul at Buenos Ayres to the State department. (Senate Doc. No. 17, December, 1896, p. 122.) The injustice of this to our sister Republics of South America and its impolicy must be manifest. The imports of Australian merino in the fiscal year 1896 were 71,627,131 pounds, and from Argentina only 15,523,911 pounds.

THE "PROTECTIVE BENEFIT" OF 12 CENTS DUTY ON UNWASHED AUSTRALIAN.
MERINO.

There is a mode of testing the "protective benefit" of a duty of 12 cents per pound to unwashed merino like that of Ohio, in competition with Australian unwashed, assuming that it is to be so classed.

Ohio XX washed must sell in Boston for 27 cents to give the Ohio woolgrower 24 cents farm value, which he needs.

Port Phillip superior was quoted in London December 19, 1896, at 11d (22 cents), and under a duty of 12 cents would sell in Boston for 34 cents, exclusive of freights, if the duty added 12 cents to the Boston price. The duty of 12 cents would give a "protective benefit" to the Ohio woolgrower as follows, with 1 cent perhaps added for freights:

	Cents.
On the unwashed.....pound	5 $\frac{1}{2}$
On the washed....."	6 $\frac{1}{2}$
On the scoured....."	13.45

This is proved by the following:

UNITED STATES TREASURY DEPARTMENT,
WASHINGTON, D. C., February 4, 1897.

DEAR SIR: Your letter to Hon. L. Danford has been submitted by him to me for answer to the following questions:

"If the Boston price of Ohio washed merino, shrinking 53 per cent. in scouring, is 23 cents per pound, and the London price of competing unwashed Australian merino, shrinking in scouring only 50 per cent., is 22 cents per unwashed pound in London, and costs, duty, and charges paid, sells in Boston for 34 cents per pound under a tariff of 12 cents per pound unwashed, what is the protective benefit of such duty on—

- "1. The Ohio unwashed merino ?
- "2. The washed merino ?
- "3. The scoured merino ?"

If Australian unwashed costs 22 cents in London, with the duty of 12 cents and charges, it would cost in Boston:

Wool.....	\$0.22
Duty.....	.12
Charges.....	.015
Cost.....	.355

(Not 34 cents per unwashed pound) or 71 cents per scoured pound.

Cost in London, 44 cents per scoured pound.

Cost in Boston of Ohio merino, 57.45 cents per scoured pound. The protective benefit therefore of a pound of scoured wool is 13.45 cents.

This would correspond to a benefit of $6\frac{1}{2}$ cents on a pound of washed. If Ohio shrinks $12\frac{1}{2}$ per cent. in washing, the benefit to unwashed would be $5\frac{1}{2}$ cents per pound.

Jos. S. McCoy, Government Actuary.

HON. WILLIAM LAWRENCE, Bellefontaine, Ohio.

Will woolgrowers be satisfied with such duties as these ?

The effects would be :

I. The free-wool farm value of Ohio unwashed XX merino, in 1896 (see Senate Doc. 17, December, 1896, p. 27) was, per pound, 9 cents; the protective benefit of 12-cent duty, $5\frac{1}{2}$ cents; farm value under 12-cent duty in competition with unwashed Australian Port Phillip, $14\frac{1}{2}$ cents; the farm value of XX washed Ohio, 1896, 14 cents; protective benefit of 12 cent duty, $6\frac{1}{2}$ cents; farm value of washed, $20\frac{1}{2}$ cents.

II. But it has been shown that the Australian "skirted" will command in our markets 3 cents per pound more than Ohio unskirted by reason of the skirting alone. This would leave the farm value unwashed only $11\frac{1}{2}$ cents and washed only $17\frac{1}{2}$ cents.

III. Theodore Justice has shown that under the new tariff the foreign prices of wools will decline 6 cents per unwashed pound; without counting the advantage of 3 cents which "skirted" Port Phillip has, this would leave the farm value of Ohio unwashed only $8\frac{1}{2}$ cents, and of washed only $14\frac{1}{2}$ cents.

IV. These are prices of XX Ohio. The *average* is not over X, and this will reduce the farm values 2 cents per pound. Our wool industry cannot survive in competition with the light-shrinking Australian unwashed, unless it be classed as washed; without this the tariff would operate as a fraud. *Sic transit gloria fraudis.*

V. With Port Phillip unwashed classed as washed, it would still have an advantage under a tariff over the merino of other countries. While Port Phillip "unwashed superior" was quoted in Liverpool, December, 1896, at 11d.=22 cents, Montevideo, "unwashed superior" was quoted only 7d.=14 cents; a difference in favor of the Port Phillip of 8 cents per pound. (See J. L. Bowes & Bro.'s wool circular). This proves that the light-shrinking Port Phillip unwashed should be classed as washed.

VI. This Port Phillip, which is quoted *unwashed* at 11d. = 22 cents, is evidently (1) so well "skirted" as to be (2) practically "sorted" and (3) of such *light shrinkage* as to be (4) substantially *scoured*. This is proved by considerations :

1. The London wool circular, December 10, 1896, of Helmuth, Schwartze & Co., quotes Port Phillip *scoured* "average to good," is. $1\frac{1}{2}$ d. to 1s. $3\frac{1}{2}$ d., which may be called 28 cents, and "*superior*" at $33\frac{1}{2}$ cents.

2. It quotes greasy (unwashed) "average to good" 18 cents, and "superior" 21

cents. This shows that *all* these unwashed wools shrink *much less than* 50 per cent. in scouring. The circular of J. L. Bowes & Bro. does not give quotations of *scoured*.

There is more evidence to the same effect. The Boston Commercial Bulletin of December 5, 1896, reports sales of wool in Boston as follows:

SALES FOR THE WEEK.

[The prices given represent the extremes and should not be confounded with the market quotations.]

DOMESTIC.

	Quantity.	Value.
<i>Fleece wool.</i>	<i>Pounds.</i>	<i>Cents.</i>
Ohio XX and XX and above.....	120,000	19½ to 20
Michigan X.....	15,000	16½ to 17
Kentucky, Missouri, etc.....	57,000	16½ to 17½
Unwashed and unmixed fleeces.....	40,000	11 to 16
Washed combing.....	20,000	20 to 22
Fine delaine.....	25,000	19 to 21
Total fleece wool.....	277,000	
<i>Western and Southern wool.</i>		
Fine spring Texas.....	170,000	10 to 11
Fine fall Texas.....	45,000	9½ to 12
Fine Territory.....	312,000	8 to 12
Fine medium Territory.....	470,000	10 to 12
Medium Territory.....	228,000	12 to 14
Spring California.....	75,000	10 to 13
Fall California.....	30,000	7 to 8
Valley Oregon.....	25,000	15
Eastern Oregon.....	315,000	11 to 12
Total Western and Southern unwashed wool.....	1,670,000	
<i>Scoured wool.</i>		
Fine scoured.....	54,000	28 to 33
Medium scoured.....	53,000	25 to 27
Low scoured.....	48,000	20 to 23
Total scoured wool.....	155,000	

FOREIGN.

Australian and New Zealand.....	638,000	19½ to 27
Foreign scoured.....	67,000	32 to 33
South American crossbred.....	30,000	19½
Cape (snow white).....	9,000	30
Carpet.....	350,000	8 to 16
Total foreign wool.....	1,094,000	

Here is foreign scoured 32 and 33 cents.

The Bulletin of December 12, 1896, has the following:

LONDON WOOL.

[Special correspondence of Commercial Bulletin.]

LONDON, December 2, 1896.

SCOURED AUSTRALIAN MERINO.

"Superior scoureds selling at 15d., and above form an exception to the general rise. This description, though selling firmly, is not quotably dearer than last sales, but the bulk of medium and inferior scoured sell at ½d. to 1d., or 5 to 7½ higher."

It is evident that the Port Phillip "average to good" 28 cents per pound would now fix the Boston price of merino wools such as are grown east of the Missouri river, and give it farm value nine cents. (See Senate Doc., 17, Dec., 1896, p. 110, as quoted by Justice, Bateman & Co.) But when the tariff comes *this price will go down*. Theodore Justice, in an article in the Philadelphia Manufacturer January 16, 1897, which is appended hereto said:

"The best grade of Australian wool in London advanced 5 cents per pound from the first half of 1895 to December, 1895. This increase in price in very little over six months was due entirely to American demand. It is certainly true that this advance having been brought about by our demand will be lost the moment we stop buying, as we are sure to do when the duty is placed on wool, because to raise the duty we, by large importations before the law is passed, will have anticipated our wants for some time to come."

The price of skirled unwashed (in the grease). Port Phillip was quoted by Hel-muth, Schwartze & Co., December 10, 1896, in London "average to good" 18 cents. A decline of 5 cents would leave the London price 13 cents "skirled," and costing laid down in Boston 14 cents per pound shrinking 50 per cent in scouring, being not over 28 cents scoured and skirled, or equal to less than 10 cents per pound Boston price for our American merino, shrinking 66 $\frac{2}{3}$ per cent in scouring. This would leave the farm value less than 9 cents and a duty of 12 cents would make it less than 20 cents, to be reduced 3 cents by reason of the "skirting" of the Australian, leaving farm value 17 cents.

All this proves:

1. That Port Phillip unwashed should be classed as washed.

2. That Consul General Wallace was correct in saying that Port Phillip whole fleeces can be put on shipboard at Melbourne for 9 cents per pound shrinking but about 50 per cent in scouring.

3. That a duty of 12 cents on unwashed merino is moderate—very moderate.

There is another mode of proving that Port Phillip unwashed should be classed as washed.

The Port Phillip unwashed, as stated, would cost skirled, laid down in Boston, 14 cents, equal to 12 cents unskirled, equal 12 cents. As it will shrink in scouring—such as would be imported, always the lightest—50 per cent., 2 pounds will make the cost per scoured pound, 24 cents; add 24 cents duty on each unwashed pound is 48 cents; cost per scoured pound, 72 cents.

It will require 3 pounds of our merino, costing each farm value 20 cents, Boston price 23 cents, or to make one scoured pound, 69 cents. The difference is 3 cents.

As to this it may be said:

1. The Australian scoured pound will sell for all of 3 cents more than the American.

2. And when the *prospective decline* in price, as shown by Mr. Justice, will still further reduce the protective benefit to American wool growers.

3. Even if these estimates should be too low on the foreign prices and the protective benefits stated not sufficiently high, yet the *prospective decline* in price will leave the result to woolgrowers no more than stated.

IX.

THE REMEDY FOR THIS WRONG TO AMERICAN WOOLGROWERS TO OUR SISTER SOUTH AMERICAN REPUBLICS.

The woolgrowers' bill proposes to remedy this wrong by providing that the unwashed Australian merino and others of similar light shrinkage shall be deemed washed. This is justified—

1. Because without it a tariff of 12 cents per pound or any fixed rate gives practically but little or no protective benefit to American unwashed merino. This is shown by the evidence of the Government actuary, Joseph S. McCoy, in my argument to the Committee on Ways and Means.

2. It simply places Australian merino on an equal footing with the other merino wools of the world.

3. It is necessary to secure reciprocal commercial treaties with South American republics required by our interests. (Senate Doc. 17, December, 1896, pp. 33, 40, 41, 72, 122, 127.)

The Montana woolgrowers, in 1895, demanded that wool duties be adjusted on the basis of a shrinkage of $66\frac{2}{3}$ per cent. in scouring.

FAR-WEST WOOLGROWERS AND 8 CENT DUTY.

4. If some far-west woolgrowers have requested lower duties (as some have as low as 8 cents per pound) it was because they *did not fully understand* (1) the conditions that now confront us (2) nor the effect of lower duties. A sufficient explanation of their mistake, is found in the letter of Theodore Justice to Hon. Charles H. Grosvenor, dated February 6, 1897, which is hereto appended,

X.

AN UNJUST ALARM—VOX, ET PRÆTEREA NIHIL.

1. And here we are met with the plausible but misleading cry that we are asking for a duty of 24 cents per pound on wool. This, standing alone, is, to those who have not studied and hence do not understand the subject, a *suppressio veri, suggestio falsi*.

2. We ask only for 12 cents per pound duty on merino wools shrinking $66\frac{2}{3}$ per cent in scouring. This 24 cents duty is only equal to 12 cents on all other merino wools of the world.

Without it the effect of a duty of 12 cents on Port Phillip *unwashed* would only give a protective benefit of about 6 cents per pound on Ohio *washed* wool, and only the unwashed Port Phillip would be imported. This means ruin to our American wool industry. (Senate Doc. 17, December, 1896, pp. 63, 33, 72, 127.)

3. We ask that Australian unwashed merino shall pay the same duty as that imposed on wools of all other countries of similar shrinkage, no more, no less—that is, 24 cents per pound, or on scoured, 36 cents.

To those who are asking that the duty be fixed at 8 cents, we may say you are promising 8 when you should know that this rate would not give a protective benefit of 4 cents. Your promise is a mistake—I will not say nor think a false pretense.

4. This is "equal and exact justice:" (a) To American woolgrowers and (b) to all the woolgrowing countries of the world. (c) It has been thrice indorsed by the National Wool Growers' Association, once by the Farmers' National Congress, and by the Ohio State Grange, by the Indiana Wool Growers' Association, January 5, 1897, and by the Utah Wool Growers' Association, August, 1896. (Senate Doc. 17, December, 1896, p. 31.) (d) In view of all this the objection to it is—*Vox, et præterea nihil*—"sound and fury, signifying nothing" when properly understood.

5 LET US NOT TAKE COUNSEL OF OUR FEARS.

On the 6th of January, 1897, representatives of the National Wool Growers' Association were heard in argument before the committee on ways and means in Congress in support of the woolgrowers' bill. By direction of the association I submitted an argument having its approval, except that some three or four, supposing, as I understood, that we might not be able to secure the duty asked for on Australian merino, deemed it inexpedient to ask it, lest it might injure our cause.

Two of these—all true friends in purpose of woolgrowers—gave their views to the committee on ways and means. I do not understand that they were willing to consent to less than 24 cents per pound duty on washed merino from any country, but I fear the effect of their position was to aid those who oppose adequate protection.

The New York Tribune of January 7, 1897, says:

"C. M. Hogg, an Ohio woolgrower and wool buyer, seemed disposed to throw cold water on Judge Lawrence's proposed schedule of duties."

The duties are not my duties. They are the duties asked for by representatives of the woolgrowers of the United States.

The Tribune's statement, I think, is not entirely accurate as to the purpose of my excellent friend from Ohio. He gave his views of expediency as to the duty on Australian merino. I do not understand that he objected to any other feature of the woolgrowers' bill.

On the 15th of January, 1896, he as chairman of a committee of the Ohio Wool Growers' Association at Columbus, reported a resolution, which was agreed to by the association, saying:

"We ask and demand of the Fifty-fifth Congress that the following duties shall be placed upon wool: A specific duty of 12 cents on the two grades of clothing wool, known in the McKinley bill as Nos. 1 and 2, and an increase of 1 cent per pound each year until the fine grade, known as No. 2, reaches 15 cents. On the grades of carpet wool, known as Nos. 1 and 2 in the McKinley bill, we ask and demand 8 cents per pound. (See Ohio Agricultural Report, 1895, p. 547.)"

And now, as to the position of Mr. Hogg before the committee on ways and means, I have to say I do believe that if he had fully considered the subject in all its bearings he would have concurred in the provision as to Australian merino. Honest friends of a good cause, by conceding too much against it may unintentionally become its most dangerous enemies.

For myself, I can only say that I deem it not only just, but expedient, to ask for all the protection required by the interests of woolgrowers. I ask only that the promised "most ample protection" be given.

Any Republican who held out this promise to the woolgrowers of the United States, cannot now with propriety or consistency aid in defeating it. Woolgrowers should not be driven from a just purpose by startling, unreasoning phrases.

Let those who object answer our arguments if they can. Woolgrowers will not secure more protection than their representatives ask; these, as candid men, will not ask more than they believe we should have; as men, tenacious of a just purpose, it would be a surrender to consent to accept less. We are told this would make a high ad valorem.

The extent of the ad valorem duty of 24 cents cannot properly defeat the demand for and the need of a just measure of protection. The lower the price of foreign wool, the greater will be the need of enlarged protection and the higher will be the ad valorem rate. The ad valorem benefit we now ask is less than the ad valorem ruin inflicted on American woolgrowers by free wool. We must justly ask "indemnity for the past, and security for the future."

I now sound the alarm and proclaim the danger—unless Australian merino be made to pay the same rate of duty on its scoured value as the general merino wools of the world, a tariff bill discriminating in its favor, will be a failure as a protective measure, and sheep husbandry will again be crippled if not be ruined in the house of its professed friends. I wash my hands of all responsibility for such injustice.

XI.

THE DUTY ON THE LONG WOOLS OF THE MUTTON BREEDS.

1. The woolgrowers' bill puts the so-called down combing and clothing wools in the same class with merino, and with the same duty of 12 cents per unwashed pound. These wools unwashed in the condition in which imported will not shrink in scouring an average of over 30 per cent. It will thus require more than two pounds of average unwashed merino to yield as much clean wool as 1 pound of the down wool, an important fact too often overlooked. A duty of 12 cents per pound on this wool is only equal to 6 cents on the unwashed merino in competition with it; of course only unwashed down wools would be imported, as these would bear the lowest extent of duty. And this is a sufficient answer to the apparently plausible but unreasoning cry that the woolgrowers' bill proposes a duty of 24 cents per pound on the long wools. The duty will be only 12 cents on unwashed wool, the only kind that will be imported. It is not possible, in a tariff bill, to meet every condition of wool, but the only injustice to woolgrowers, as to this class of wool, is that their bill discriminates in its favor as against merino wools.

The prominent wool dealer, Samuel Lee, of Philadelphia, in a letter of January 5, 1897, said to me :

"Be sure and have the same duty on washed combing and clothing wool—no 12 cents on one kind and 22 cents on the other."

And in a letter of February 3, he said:

"South American crossbreeds want a good duty put on."

A WEAK POINT IN THE WOOLGROWERS' BILL.

The woolgrowers' bill does not place an adequate tariff on crossbred wools. Their shrinkage is so light in scouring as to impair much of the protective benefit of a tariff. They supplant the use of merino wools, having most of their qualities. For these purposes foreign wool growers are resorting to crossbreeding. But in a spirit of compromise and concession I have yielded my own conviction of the need of an increase of duty on these wools.

It is certain that 12 cents duty on this wool will really be a discrimination in its favor. (See especially Senate Document 17, December, 1896, pp. 118, 123, 125-126.) In order to encourage the production of the long wools, a good protective duty on so-called carpet wools is necessary, thus to *induce carpet manufacturers to use the long wools in the manufacture of carpets.*

2. I appended to the argument I made before the committee on ways and means January 6, 1897, tables of prices of wools. (See *Tariff Hearings.*)

Coates Bros., of Philadelphia, wool merchants, quoted September 1, 1896, the price there as follows: "Washed Canada ordinary, 18 to 20 cents; coarse washed, 17 to 19 cents."

	Cents.
The average Philadelphia free wool price is (this washed wool is substantially scoured).....	18½
Deduct cost of American wool to reach Philadelphia market.....	3
Leaves farm or ranch value.....	15½
If 12 cents duty would give a protective benefit of that amount.....	12
It would make the farm value for practically scoured wool.....	27½

This would about equal unwashed price, 20 cents.

This is by no means "the most ample protection." The Down sheep will not produce as much wool as the Merino, they consume more feed than Merino, and

they can not be kept in as large flocks as Merino, and hence need ample protection. By Down sheep I mean all the mutton breeds.

3. ANOTHER CONSIDERATION.

The wool circular of Justice, Bateman & Co., December 3, 1895 (Senate Document No. 17, December, 1895, p. 69), says:

"One of the surprises of free trade in wool is the neglect of American quarter-blood even at July prices, while the same grade of English and Australian have advanced over 33 per cent. since July. American manufacturers, strange as it may seem, continue to import them at the advance. This is particularly unfortunate, as this is the grade of wool produced by the so-called mutton sheep that woolgrowers are raising in order that mutton shall be as important a feature in sheep husbandry as wool was formerly."

We must encounter this preference given by manufacturers to the foreign wool, with its effect in reducing prices not only of our down wools, but our merino wools also, especially the preference given to Australian merino.

XII.

THE DUTY ON THIRD-CLASS WOOLS.

The woolgrowers' bill asks for a duty of 8 cents per pound on all other unwashed wools. The argument in support of this will be found in Senate Document No. 17, December, 1895, pages 71-75, 80 89, 173, and in Senate Document No. 17, December 2, 1896, pages 118, 124, and still more fully in my argument before the committee on ways and means January 6, 1897, which will be printed in the volumes of Tariff Hearings. In brief, the arguments are:

1. These wools *used in the manufacture of clothing* compete with merino and down wools. (Senate Document No. 17, December, 1896, p. 35, 36, 118, 119, 157.)

2. As these unwashed wools are imported, they will not shrink in scouring 30 per cent., so that every pound imported yields as much clean wool as two pounds of unwashed merino. (Senate Document No. 17, December, 1895, pages 50, 9, 48-54, 145.)

3. In order to encourage the raising of Merino sheep and the Down mutton sheep, *to give cheap meat food to our cities and manufacturing districts*, the merino and down wools must be protected from the ruinous competition of these cheap foreign wools.

4. In the fiscal year 1895 the imports of China wool were 26,089,418 pounds, at an import free-wool price, with no motive of undervaluation, of 5.15 cents per pound, with each pound yielding as much clean wool as two pounds of merino. (Senate Document No. 17, December, 1895, p. 39-45.)

5. In the fiscal year 1895 the total imports of all the wools of this class, including China, were 144,488,255 pounds, at an average import price of 9.9 cents per pound, while the imports of merino and the down wools were only 121,237,612 pounds. Thus the vast amount of imports of these wools work more ruin to our wool industry than all others.

6. The McKinley bill of 1890, as originally reported, proposed a duty of 8 cents per pound on the higher grades of those wools. Nothing less than 8 cents per pound duty on all will be even a moderate protection.

7. The woolgrowers' bill proposes to admit Mexican carpet wool breeding ewes free for two years, and with them Texas alone can soon supply all needed. We now produce carpet wools. Some who deny this are not consistent.

[From Boston Commercial Bulletin, January 9, 1897.]

"Carpet wools are not grown in the United States."

[From the same Bulletin, August 15, 1896.]

"We also raise a certain amount of third class or coarse wools in Colorado and New Mexico from the native Mexican sheep. The rough wool on the bellies and (breach) of our sheep is also "sorted" in this class. (Senate Document No. 17, December 2, 1896, p. 157.)"

The Bulletin of January 9, 1897, says of the duties proposed in the woolgrowers bill, that:

"The leader of the growers (Lawrence) admits that the duties are prohibitory. He glories in the fact."

This is an error. *None of the duties in the bill are prohibitory.* The bill would raise probably \$10,000,000 annual revenue. When our flocks shall be sufficient to supply all needed wools of all kinds, then duties should be prohibitory.

It is of the utmost importance to increase the number of our sheep, including carpet-wool sheep, to utilize lands that cannot be made available for any other purpose. There are millions of acres of prairie lands in Texas, New Mexico, etc., on which cattle can not be kept, but sheep can, for two reasons:

1. The grass is so sparse that cattle cannot secure enough for a support, but sheep can.

2. Cattle must have water every day. Sheep, like the camel, can go two or three days without water and can then be supplied by being driven considerable distances to stock water ponds, or water furnished otherwise.

XIII.

NO NEED OF FOREIGN WOOLS TO MIX.

The eminent wool manufacturer, Charles Fletcher, in a letter February, 1890, says:

"This talk of mixing Australian wool with domestic wool to make goods required for this market is all nonsense, as Australian wools are only used here when they are cheaper than domestic wools." (Senate Mis. Doc. No. 35, Fifty-third Congress, second session, p. 29; Mis. Doc. No. 124, same session, p. 22.)

XIV.

The wool growers have friends among wool dealers, as shown by the following:

'SAMUEL LEE & Co., WOOL AND COMMISSION MERCHANTS,
PHILADELPHIA, January 12, 1897.

"DEAR SIR: The duty wanted on wool is 12 cents on fine unwashed, double duty on washed, and treble duty on scoured China wool, 12 cents duty; on Bagdad wools, 10 cents; on noils, 20 cents, and on ring waste, 20 cents, and rovings, 30 cents. We remain,

"Yours, truly,

SAMUEL LEE & Co.

"Hon. WILLIAM LAWRENCE."

And Samuel Lee, in a letter February 5, 1897, says:

"Be sure and have the same duty on washed combing and clothing wool—no 12 cents on one kind and 22 cents on the other kind."

It is regretted that some others, wool dealers, are opposing duties deemed necessary by woolgrowers. (Senate Doc. 17, December, 1896, pp. 30-34, 60-65, 97, 130, 181.)

PROSPERITY FOR MANUFACTURERS.

An attempt is made to alarm the public by saying the duties asked for by wool-growers "would close every mill in the United States." This is absurd. The wool manufacturers never prospered so well as under the act of 1867, with very much higher wool duties for conditions then existing than those now asked. The act of 1890 imposed 11 cents per pound on merino; the woolgrowers now ask 12 cents. This false cry of alarm is akin to that by which woolgrowers were literally deprived of adequate protective benefits in the act of 1890 by its ad valorem duties and other contrivances no better.

XV.

FOREIGN RAGS, SHODDY, ETC.

The woolgrowers' bill asks for prohibitory duties on foreign woolen rags, shoddy, mungo, and other wool adulterants. The reasons in favor of this will be found in my argument before the committee on ways and means, and in senate documents to which reference has been made. Anything less than prohibition will permit it not invite the coming of leprosy and all the vile diseases of the eastern hemisphere embedded in foreign rags, the mission of which will be not only to bring death, but robbery and fraud in shoddy goods imposed on the American public as all new wool.

Gentlemen, once more let us with renewed energy earnestly ask the American congress at least to give us ample protection for sheep husbandry, so long delayed and denied. And upon our bill we invoke the considerate judgment of the American people and the just favor of the American congress.

XVI.

ANNUAL INCREASE OF WOOL DUTIES.

The woolgrowers' bill provides for an annual increase of—

"One-half cent per pound for four years on unwashed wools and hair, and 1 cent on washed and 1½ cents on scoured wools and hair."

This was not agreed to in the bill found in the proceedings of the national association in December, 1895, but is found in the bill having all the indorsements mentioned by the association in December, 1896, in January, 1897, and by the Ohio State Grange and the Farmers' National congress of December, 1896; by the Utah Woolgrowers' association, by the New Mexico Woolgrowers' association, and by the Indiana Woolgrowers' Association. It is justified on two grounds:

1. It proceeds on the theory that in four or five years at most the American woolgrowers, with "the most ample protection," will have increased their flocks sufficiently to supply all needed wools, and then sound policy will require that none should be imported. Why buy any foreign wool when we can supply all needed? But even then it can come by paying duties on merino wool, even *then* LESS than those provided in the wool tariff of 1867 in view of conditions then existing.

Our farmers now can supply all needed wheat. Will any statesman say we should *reduce our product* so as to import some with a duty to secure revenue? If not, then why not apply the same rule as to wool?

2. It has already been shown that it is quite certain that the price of foreign wools will decline (1) to get into our markets; (2) because foreign woolgrowers can afford to reduce their price for this purpose and still make profit.

The wool circular of Justice, Bateman & Co., February 1, 1897, fully proves this. It says:

"The best class of skirted Australian wools on at least two occasions within the past eleven years have *been 6 cents per pound* below the present price, and *will in all probability soon be that low again* after the reimposition of a tariff on wool."

This has been shown by the quotations of prices already given.

XVII.

HOW NOT TO DO IT.

An eminent wool merchant, whose ability and influence are great and whose good faith is beyond question, suggests that the duties on wool "shall be something lower than the McKinley law." He mentions 8 cents per pound duty, which, I understand, is for unwashed merino, and he adds:

"In my judgment before another presidential election the price of Port Phillip wool will fall 6 cents per pound. * * * I am in favor of an annual increase of 1 cent per pound for a period of four years until the duty shall reach 12 cents per pound on unwashed wools of the first class. I am satisfied that the cost to the American consumer will be from 2 to 5 cents per pound less on wool and from 8 to 20 cents per pound less on cloth by 1901 than the cost of these articles to American consumers during the average of the McKinley period."

In this connection see Senate Document No. 17, December, 1896, pages 30-36, 61-65, 97, 130, 181.

In brief, the proposition is, as I understand, to begin with 8 cents on unwashed merino, with an increase of 1 cent for four years, so that in 1901 the duty would be 12 cents; but by that time the decline in the world's prices would be 6 cents per pound, leaving the duty equivalent to only 6 cents—the duty to be increased less than the decrease in the world's price.

Of course the "skirting clause" would be a part of this scheme to keep the duties "something lower than the McKinley law." And this policy would evidently require that ad valorem duties, or worse, on third class wools, be "something lower than the McKinley law." This is not "hope deferred" to the next century, but it "makes the heart sick" with prices growing less and less and protection practically less and less. And this is the feast to which we are invited under the promise of "the most ample protection." "False pretenses" are indictable crimes, except when they cheat woolgrowers.

It has been shown that the wool growers—even with free silver leanings—elected McKinley president. (Senate Doc. No. 17, December, 1896, pp. 30, 70, 79, 85, 94, 115, 179.) But not for an 8 cent duty, with a prospective decline in the world's prices of 6 cents per pound, thus to that extent reducing the protective benefits of the tariff.

THE WISE MAN FORESEETH THE STORM.

President Cleveland and the congress he "had on his hands" gave us free wool. The woolgrowers responded by giving us McKinley and a congress pledged to "the most ample protection for wool." Cleveland and his congress broke no pledge, but they brought ruin. The fifty-fifth congress "may profit by their example."

If now we should have what we cannot believe will come, broken pledge and ruin to the wool industry, we may fear, we may predict, even against our desire, that woolgrowers may be driven to look to another source of protection for the wool industry.

Theodore Justice, an eminent Republican, referring to the recent presidential election, said:

"The woolgrowers were tempted by the proposition that Bryan's election meant a premium of 50 per cent or more upon gold, which would be equivalent to that much tariff protection, as the duties as well as the cost of importing would be paid in gold,

but they never forgot that Bryan voted for the Wilson bill, which destroyed one-third of this great industry. * * * On the other hand, McKinley favored * * * protection for wool * * * and enough woolgrowers in these states, with free silver leanings, voted for McKinley in their struggle for life, to elect him, and his election was due to the McKinley protection, which woolgrowers in those states believe in."

The gold protection cannot be evaded by perjury, as can ad valorem duties. To be forewarned is to be forearmed.

A TARIFF THAT WILL STAND—WOOL MANUFACTURERS AND THE TARIFF.

Some wool manufacturers and dealers are urging a low tariff on wool thereby to secure a tariff that will endure. "History repeats itself." The highest wool tariff we ever had for conditions then existing was that in the act of 1867, which endured for *sixteen years*.

Lower duties came with the act of 1883, which stood but seven years. Better protection came with the act of 1890, which was repealed by the Wilson act of 1894, not because of the wool tariff, but for other causes well known. But the people, by an overwhelming majority, repudiated free wool—indorsed "the most ample protection." Any tariff less than this can not endure.

It is a remarkable fact that those wool manufacturers who are proposing low inadequate wool duties—duties much less than those of the act of 1890—have not proposed to reduce the rate or mode of "compensatory duties" adopted by that act—they pronounce it "scientific." The duties they propose for woolgrowers are neither scientific nor adequate.

PROTECTIONISTS BEWARE.

The political party of protection in congress passed the bill which became the Tariff act of 1883 reducing the rate of wool duties in the act of 1867. The result was that in Ohio the Democratic state convention of that year denounced the reduction of the wool duties, and on that issue elected a democratic governor, a democratic legislature, which in turn elected a democratic United States senator. The wool duties of the act of 1883, in view of conditions then existing, and with the much higher prices of wools then throughout the world, were much more protective than would be the duties now asked for by the woolgrowers' bill. Congress may now profit by the example of the election in Ohio in 1883.

XVIII.

CONFERENCE WITH THE WOOL MANUFACTURERS.

On January 7, 1897, the representatives of the wool manufacturers' association made arguments before the committee on ways and means in favor of, duties for woolen goods and to some extent in opposition to the duties asked for by the woolgrowers. Subsequently, at an informal conference of woolgrowers and wool manufacturers, it was advised that a joint meeting of committees from the two national associations be held with a view to agree upon a schedule of tariff duties which should be mutually satisfactory. For this purpose a meeting of the executive board of the national woolgrowers' association was arranged to be held at the Ebbitt House, Washington, D. C., February 9, at 10 o'clock A. M.

The result of this conference will be made known in due time.

We now with renewed energy earnestly ask the American congress at last and speedily to give us ample protection for sheep husbandry, so long delayed and denied. And upon our bill we invoke the considerate judgment of the American people and the just favor of the American congress.

Sundry papers are hereto annexed by way of appendices to this argument.

The President: We are to meet, as I have said, on the 9th of February at Washington to confer with the wool manufacturers. I do not expect that we will be able to agree with them, but it is fair to give them a chance. I know that two years ago when we asked for a conference with them they refused it. They have the advantage of us in this, that they have and will continue to have, the speaker of the House and the chairman of the committee on ways and means in the House, both from New England, and the chairman of the finance committee in the Senate, and they are able to gather together in twelve hours one hundred wool manufacturers, and they have unlimited means and money at their command. They can publish documents and keep delegates there, button-holing the members of congress, and in that way they have the advantage of us. Wool-growers are scattered. You never find those wool manufacturers divided on anything. They never quarrel with one another. But wool growers unfortunately seem to be somewhat divided. For myself, I shall ask nothing but what I believe to be right, and I shall never let down the just claims of the wool growers to the performance of that promise upon which McKinley was elected, and without which he could not have been elected. The wool growers of the United States saved the election of McKinley. In six closely contested states the majority was so small that a change of twenty-five thousand votes would have elected Bryan. I have the proof of every statement I make, and it was equally demonstrated, too, that in those states there were enough free silver Republicans who were more interested in the wool tariff than free silver, who voted for McKinley, to save his election. What I want now is that the wool growers of Ohio shall occupy a prouder eminence, than they have heretofore done in behalf of legislation for the wool growers, and that they shall now stand up for this wool growers' bill and let the whole country know that we intend to demand our rights.

Now, gentlemen, I have never asked this association to print any speech of mine, but they have printed a good many of them without being asked, but if you believe that these arguments in support of the duty which the wool growers ask for, will be of value, I do believe it would be well to have this printed in numbers sufficient to send to all our senators and representatives in congress and scattered among the wool growers' associations of the United States.

Senator Hogg: Mr. Chairman, as chairman of the committee on resolutions I beg leave to submit the following report which was unanimously agreed upon:

WHEREAS, the severest blow ever dealt to agriculture in the United States, was inflicted by the tariff of 1894, and the most disastrous of all was the placing of wool on the free list; it has depleted American flocks one-third and reduced the prices of wool fifty per cent., pauperized labor and caused a loss to the wool growers in three years of over one-hundred

and seventy-five million dollars, without compensating advantages worth mentioning in any direction; and

WHEREAS, it is fast eliminating a most important branch of industry from the already too few, from which the farmer, the farm laborer and others must draw support; and instead of being a business from which many farmers drew their principal revenue, has become inconsequential and profitless; and

WHEREAS, we believe it is the very first and highest duty of the incoming administration and congress to remedy these wrongs by a revision of the present tariff at the earliest possible moment; therefore, be it

Resolved, That such duty should be put upon wool as will fully restore this important industry, and we believe that the rates asked for in the bill adopted by the National Wool Growers' Association in December, 1895, approved in November, 1896, by the Farmers' National Congress, by the Ohio State Grange in December, 1896, and by the National Wool Growers' Association in December, 1896, and again in January, 1897, and now before the Ways and Means committee, will secure the American market to the American wool grower.

Resolved, That the new tariff act should contain a clause requiring additional duties on wool and woolens in bonded warehouses or imported after March 5th, 1897, shall be secured before taken out of bond.

Resolved, that *ad valorem* duties invite fraud and deception and we are utterly opposed to the same.

Mr. A. H. Kling, of Marion county, moved the adoption of the resolutions.

Secretary W. N. Cowden: "Resolved that such a duty should be put upon wool as will fully restore this important industry," etc. Now, that don't say that we approve this bill. I would like to have these resolutions indorse this bill, that has been approved by the Farmers' National Congress and other farmers' organizations, and I move as an amendment to the committee's report that in the fourth line on the second page we insert the words "and that said bill is hereby indorsed by this association."

The President: Gentlemen, you have heard the motion to amend.

Senator Hogg: There was quite a different understanding in that committee, and I know there is a difference in sentiment of the people sitting here, but if it is thought best to adopt this amendment I shall most cordially acquiesce.

And thereupon the motion to amend was unanimously adopted, and the motion to adopt the resolutions as amended was unanimously carried.

The President: We have two delegates now to appoint from this association to go to Washington. Under the constitution you can appoint as many more as you choose. The constitution of the National Wool Growers' Association provides that the president of each state association shall be a delegate and that each state association shall appoint two others.

And thereupon Mr. J. M. Lewis, of Wyandot county, A. H. Kling, of Marion county, and Senator Chas. M. Hogg, of Harrison county, were nominated, but Mr. Kling at once declined the honor, stating that it would be impossible for him to attend the conference; and, thereupon, Messrs. Lewis and Hogg were unanimously elected delegates to the conference of wool manufacturers and wool growers to be held in Washington, D. C. on February 9th, prox.

J. H. Brigham: I move that the committee be authorized to call to their assistance any man representing their interests that they may find in Washington, or elsewhere at that time.

Senator Hogg: I would suggest this to the members present, if they can think of anyone in their counties that would like to go that they suggest their names to the committee. I will say this: I would not have too many. There were only about twenty persons there last week, not only from Ohio but from the United States, and four were from Ohio.

The motion was unanimously adopted.

Col. J. H. Brigham: I have had some little experience there, in trying to secure legislation for the agricultural interests, and I have found it a very great help if the people who live at home correspond with their representatives and senators and back up the efforts of the committee that is at work in Washington. The representatives and senators probably would not go before the committee with an argument, but if the pressure is quite strong at home they will quietly, in the cloak rooms and elsewhere, suggest to the committee that it is well enough to look after what these people are asking for, and see that they do justice by this great interest.

The President: You might suggest too, Col. Brigham, that we recommend to the wool growers of Ohio in the several congressional districts, or recommend, that they write to their senators and representatives to aid them to secure the passage of the wool tariff bill now before congress.

Col. Brigham: I make that motion.

The President: I remember that the wool manufacturers who proposed an insignificant and contemptible rate of duty, issued a circular calling upon their representatives and senators to support it, and they were all in favor of it.

Col. Brigham: I was before the same committee that has charge of this bill and everything indicated that the committee was not favoring the bill; that is, they thought it was an extreme measure, and we adopted this same plan that I have suggested, and you will notice in the Ohio Farmer that one of the active members said he received a telegram about every fifteen minutes from his constituents and they changed their minds and thought they ought to pass the bill and did pass it. It was the very active work on the part of the constituents of the congressmen that secured that just and wise measure.

And, thereupon, the motion was adopted.

Senator Hogg: I think we have left out one important matter, and that is the matter of commanding. I think there should be a committee appointed in every county. I hope to do it in my county, and I think the farmers will respond. There should be a lot of resolutions gotten up in the different counties. And now, if these men, these delegates who are to meet the delegates representing the wool manufacturers, should agree upon a bill, a bill is not a law. I presume Judge Lawrence intends to remain there, and I would say to the gentlemen here that you could not do a wiser thing than to raise a considerable sum of money, and send Judge Lawrence and someone else—I am not speaking for myself because I shall not be there, but I would be very glad to give my part towards making a sufficient amount to uphold the hands of those gentlemen and pay their expenses there.

And now, Mr. President, I would nominate Mr. Thomas L. Morris also as a delegate from this association to attend that conference at Washington on the 9th of February. The nomination was seconded and Mr. Morris, of Greene county, was made a delegate.

And thereupon, the Association adjourned.

PROCEEDINGS
OF THE
FOURTH ANNUAL MEETING
OF THE
Ohio State Dairy Association,

Held in City Hall, Columbus, Wednesday Evening, January 13, 1897.

ADDRESS OF PRESIDENT,

PROFESSOR THOMAS F. HUNT, Ohio State University.

It is my purpose to-night to review briefly state and national legislation of the past year as it affects the dairy interests of Ohio.

To begin with state legislation. The act to regulate the sale of milk was amended on April 14, 1896, so that legal milk hereafter shall contain not less than 12 per cent. solids in place of $12\frac{1}{2}$ per cent. as heretofore, not less than one-fourth of which must be fat, except during the months of May and June, when milk must contain not less than $11\frac{1}{2}$ per cent. of milk solids instead of 12 per cent. as heretofore. Inasmuch as we do not buy milk for the water which is in it, but for the solids which it contains, it is evident that the consumer who heretofore got eight cents' worth of milk may now only get seven cents' worth when buying equal measure.

On March 3, 1896, an act was passed by the state legislature requiring that "all compounds made in imitation or semblance of cheese and not made exclusively and wholly of milk or cream with salt, rennet, and with or without harmless coloring matter but containing no fats, oils or grease not produced from milk or cream, shall be labeled 'Filled Cheese,' and all cheese made exclusively from milk or cream with salt, rennet and with or without harmless coloring matter and containing less than 10 per cent. of pure butter, shall be labeled 'Skimmed Cheese.'" This bill further provides that "every manufacturer of full milk cheese may put a brand upon such cheese so manufactured indicating full milk cheese, with the date and year when made, and no person shall use such brand upon any cheese made from milk from which any of the cream has been taken." So far as this bill relates to filled cheese, it has been made unnecessary by subsequent action of the national government which I will presently mention. Doubtless the position that Ohio took on the question of filled cheese influenced national legislation.

So far as this act relates to skimmed cheese it is worse than a farce. Cheese made from full milk will contain, on an average, more than one-third butter fat and will never contain less than one-fourth butter fat. No cheese made from ordinary milk, that is, milk of 3 per cent. fat or over, will contain less than 25 per cent. of butter fat unless the milk had been skimmed. No cheese will contain less than 10 per cent. of butter fat unless from two-thirds to three-fourths of the butter fat had been removed from the milk before the milk was used for making such cheese. Such a law is worse than useless because few persons would think of making such

cheese. Such cheese would usually remind us of the famous Suffolk cheese, "so hard that pigs grunt at it, dogs bark at it, but none dare bite it." Bloomfield thus writes of this cheese:

"Mocks the weak effort of the bending blade,
Or in a hog-trough rests in perfect spite,
Too big to swallow and too hard to bite."

I am aware that the chemists for the Ohio State Dairy and Food Commissioner have analyzed some cheese containing less than 10 per cent. of butter fat which did not answer to the above description and might possibly be palmed off on the unsuspecting public, while in a semi-cured condition, as fair cheese. It is only necessary to allow a bit, which is more than one-half water, to dry in order to thoroughly condemn it. This act concerning the skimmed cheese which is certainly a step in the right direction, is a dangerous one because it gives legal sanction to cheese containing from 10 per cent. to 25 per cent. of butter fat and, by inference, indicates that such cheese is not skimmed cheese though, as a matter of fact, it is.

We give below the analyses of four cheeses in the annual report of the Ohio Dairy and Food Commissioner for 1895. Two of these cheeses are skims of the worst sort containing less than 10 per cent of butter fat. One contains 13 per cent. and the other, purporting to be full cream cheese, contained 24½ per cent. butter fat. We also give the average analysis of full cream cheese as found by the experiment stations. To show the difference in value of these cheeses we give their food value expressed in heat units or calories, and their relative value, calling the average cheese 100:

RELATIVE FOOD VALUE OF CHEESE.

Number.		Water.	Ash.	Casein and sugar.	Fat.	Heat units.	Relative food value.	Commercial value, cents per pound.
1	Average cheese.....	33.25	2.10	29.15	35.5	204,000	100	9.5
2	Full cream (so-called).....	34.22	3.2	36.00	24.5	170,000	83	6.8
3	Part skimmed cheese.....	53.1	3.9	35.7	13.0	121,000	59	4.0
4	Skimmed cheese.....	60.01	4.89	32.35	2.6	71,000	34	1.3
5	Skimmed cheese.....	53.90	5.5	36.80	.7	71,000	34	0.9

The relative food value is based upon the number of heat units each cheese contains. It will be observed that No. 3, marked part skimmed cheese, would be worth but four cents when an average cheese was worth ten cents. Probably two-thirds the butter part had been removed from the milk before it was used for cheese making and yet it would not be branded under the law as skimmed cheese.

The commercial value in cents per pound is obtained by multiplying the pounds of butter fat contained by twenty-five and the pounds of casein by two, which is about their relative commercial values. This column brings out the large commercial fraud involved when such cheeses as Nos. 3, 4 and 5 are sold for full milk cheese.

No. 2 which was sold as a full cream cheese was a night skim, or it was made from milk below the legal standard, or it had been skimmed in making. This cheese is worth in heat units 6.8 cents when average full milk cheese is worth 10 cents. It is possible to make such cheese from 3½ per cent. milk after one pound of butter has been taken from the night's milk. We believe that there is something to be said in favor of the proposition that night skims are necessary for self protection in the present state of the trade. We are not denouncing men who practice it for these reasons, but we do ask them to join hands with us in trying to remedy the condition and we do assert that the law which was passed by the last legisla-

ture not only protects the man who takes a pound of butter from his night's milk on the plea that he must compete with York state cheese, but it protects the man who takes all the butter fat out of his night's milk and then takes some more out in the morning and replaces with consummate skill, that we cannot but admire, the butter fat that the cheese should contain with that health giving fluid, water.

While the branding of full cream cheese, and the protecting of that brand by law in some measure protects the manufacturer of high class goods, it does not after all reach the heart of the difficulty. On December 22, 1896, the wholesale market at Cleveland for York state cheese, was $10\frac{1}{2}$ cents to $11\frac{1}{2}$ cents, for new Ohio cream cheese, 10 cents to 11 cents, and for Ohio state, new, $9\frac{1}{2}$ cents to 10 cents. Ohio state cheese was therefore 1 cent to $1\frac{1}{2}$ cents below New York state cheese. Undoubtedly much of the Ohio state cheese is manufactured by the same process as the New York state cheese and is equal in quality, and the manufacturer should receive an equal price, but the reputation of Ohio for making skimmed cheese is such as to lose to its manufacturers, from a cent to a cent and a half per pound, and as nearly 20,000,000 pounds of cheese are manufactured in Ohio annually, this means a loss of from \$200,000 to \$300,000 annually, not to the cheese manufacturers, who are paid so much per pound for manufacturing the cheese, and an additional price per pound for manufacturing the butter skimmed from the milk before it is made into cheese, but a loss to the farmers who produce the milk. What we need to do in this state is to raise the reputation of the cheese so that when you go to market to buy good cheese, you are not ostensibly sold New York cheese, and so that our hotels will not print on their bills of fare York state cheese, but instead Buckeye cheese. A step in this direction I believe would be an amendment to the act which we have just been discussing which shall read as follows: "All cheese made exclusively and wholly from milk or cream with salt, rennet, and with or without harmless coloring matter, and containing less than 20 per cent of pure butter fat, shall be labeled 'Skimmed cheese.'" The act which we have just been discussing requires that every guest and patron of hotels, restaurants, or lunch counters shall be notified when he is served with filled cheese or skimmed cheese. On February 13, 1896, the state legislature also amended the act concerning the manufacture and sale of oleomargarine, to the effect that "every proprietor, keeper, manager, or person in charge of any hotel, boat, railroad car, boarding house, restaurant, eating house, lunch counter, or lunch room" who serves oleomargarine in any manner either in cooking or otherwise shall display a card in a conspicuous place, "Oleomargarine sold and used here."

On April 10, 1896, Representative Hopkins of Illinois said, referring to the so-called filled cheese bill, in the house of representatives of the United States congress: "This is one of the most important bills that comes before this house at this session," The extended discussion which followed upon the bill on April 9th, 10th and 11th in the house of representatives, and the subsequent discussion in the senate, show that many other members of congress were of the same mind. This bill which is now a law, defines filled cheese as follows: "All substances made of milk or skimmed milk with the admixture of animal oils or compounds formed of such milk and made in imitation or semblance of cheese." Under this bill the manufacturer is taxed \$400, the wholesale dealer is taxed \$250 and the retail dealer \$12. On all filled cheese there is assessed and collected a tax of one cent per pound. Imported filled cheese must pay an internal revenue tax of eight cents per pound in addition to any import duties which may be imposed. Any filled cheese which is adjudged deleterious to the public health shall be forfeited to the United States. It should perhaps be mentioned that the wording of this bill prevents the addition of any foreign substance to full milk cheese, as is often done in potted and other forms of fancy cheese. This was not the intention of the bill and it is unfortunate that the bill was not more carefully worded in this particular. While this subject was pend-

ing in congress the officers of your association were active in urging the passage of this bill. Two circulars were sent out signed by the president and secretary of your association, calling upon the farmers in the state who were interested in pure dairy products to work for the passage of this bill. Your president appeared before the sub committee of the committee on ways and means in the house of representatives and he can testify from what he there learned that the dairymen of the state had heeded the circular which had been sent out and that the petitions which were poured in upon the committee as a result of this circular were not without influence.

From this somewhat disconnected survey of recent legislation I think that it will be seen that the dairy interests of Ohio have all the protection against surreptitious sale of oleomargarine and filled cheese. There can be no objection to any one using either one of these substances, provided he knows what he is using. What we have left to do to improve the dairy interests of Ohio is to improve the reputation of the dairy products which we have to sell, especially those which we export beyond our borders where we come into competition with the products of other states. We produce nearly 60,000,000 pounds of butter annually. Ohio creamery butter sells from one and one-half cents to three cents per pound below Elgin butter. Creamery men who sell fancy butter upon the Cleveland market must take three cents a pound less than Elgin butter simply because it is made in Ohio. Of course all butter is not made in creameries, but I believe that it will be no exaggeration to say that we get three cents a pound less for the butter made in Ohio than we should because of our reputation as butter makers. If this is so it means a loss of nearly \$2,000,000 annually to the farmers of the state of Ohio. Can we not do something to raise the standard of butter and cheese in Ohio? And is there any better way to do so than to make better butter and cheese than we have been making?

PRODUCER vs. CONSUMER—RIGHTS, DUTIES AND PRIVILEGES UNDER THE PURE FOOD LAWS OF OHIO.

By J. E. BLACKBURN, Dairy and Food Commissioner.

[Read at the meeting of the State Dairy Association, Columbus, January 13, 1897.]

There is no question that I can think of that compares in importance with the question of food. It is a question that one must meet and settle (I was about to say digest, but all food is not digestible) at least three times a day in his onward march from the cradle to the grave. I think it was Owen Meredith who said:

"We may live without art, we may live without books,
But civilized man cannot live without cooks."

The science of preserving, for it is a science, has made such wonderful progress within the last few years that could old Françoise Appert, who canned the first vegetables in 1809, come back and see what the business has grown to be, he would doubtless lose his breath again with astonishment at the long line of canned meats, canned fish, canned vegetables and fruits and milk, and, in fact, everything needed to sustain life, including such unique preparations as canned potatoes, canned bacon and canned toast—a condition of affairs that certainly is important enough to merit our most serious consideration, and indicate that Meredith might possibly have been mistaken, and that the only things needed for a first class meal are the requisite dishes and a good can opener. The business has grown from one small factory with a limited output and crude appliances in 1809, to thousands of fac-

tories, employing millions of dollars of capital, an army of labor and producing hundreds of millions of product, handled by brokers, jobbers and dealers in every town in the United States, and spreading throughout every part of civilization to every known market, even finding its way to the forest and jungle of the savage and barbarian.

With all these great firms, with their great capacity and resources, and the keen competition that such business conditions engender, it is but reasonable and natural to suppose that abuses should creep into the business. Slowly at first, perhaps, surreptitiously working their way into what is but too readily accepted as a trade custom or usage, and shielded by precedent, goaded by the necessities of competition and of profit, the one-time prevalent habit of reducing the size of the container or filling up with water to make weight, has been superseded by some of the most complicated mysteries and sometimes deleterious combinations that the ingenuity of man can invent, compound or suggest. And these things are sold for the daily food of an unsuspecting and often indifferent public.

Sold as they usually are by some high sounding name and liberal advertising, it is high time, in my opinion, that we stop to consider our race to degeneracy and dyspepsia, and return if we can to the good old fashioned rule of plain food and plenty of it.

It is the state's right, and more, it is the state's duty, to establish a limit upon the artificial production of food, and say to those who would sacrifice the public health upon the altar of Mammon and grow rich by sophistication and adulteration,

"Thus far shalt thou go and no farther."

The people of Ohio, with a characteristic combination of theory and practice, have taken the lead in this much needed legislation and established a safeguard over the food, drink and medicine of the citizens of the state, and provided ways and means to prevent abuses of all kinds in all articles intended to be consumed by man.

We are all consumers, no matter what our occupation; no matter if we do exist without cooks, we cannot live without eating and drinking. We may be very particular about what we eat, and still more particular about what we drink. But if we would live we must do both, and from the fact that we must eat to live we inherit the inalienable and indisputable right to know exactly what we do eat, how and from what it is made.

For the purpose of showing how abuses may be concealed under the cloak of custom or usage, I wish to call your attention briefly to a very remarkable condition of affairs. I state it as a fact and challenge contradiction, that one cannot go into the markets of any city in the United States, or any other civilized country, and sell pig iron (from which cans are to be made for canned goods) without giving the exact proportion of the different ingredients that compose this metal to the prospective purchaser. More than that, he cannot sell the pig tin with which the sheets are coated for making cans, nor the solder with which the cans are sealed, without giving the exact constituents of each, backed up by the name of the maker with his guarantee that the representation shall prove exactly as made. And I invite your careful consideration of the fact that when we ask as to the contents of the can, the only part of the merchandise intended to serve as food, we are met with the reply that these are trade secrets and must not be made public, that it might prejudice the people against the product. This statement can readily be verified.

And when the great power of the state is invoked to investigate these food products, and the state, after careful consideration, orders certain questionable practices to be stopped, as the state has a right to do, it is the duty of every good citizen to promptly, cheerfully and earnestly co-operate with the public officials to fully, fairly and impartially enforce that decree. And all good citizens will, so far as they can, observe the law and abide by its provisions.

And to those who will not heed the friendly voice of admonition, I have to say that the principle of these laws is just, eternally just; that they are founded upon a principle as high, as broad, as enduring as the heavens. And that principle is, that no person, firm or corporation has a right to deceitfully prepare or sell any kind of merchandise, be it food, medicine or what not, that is not exactly what it is represented to be when the sale is made. And any purchaser has a right to feel aggrieved when these conditions are violated, and it is a principle that is older than jurisprudence that the injured party has a right to action in such cases.

Let us specify. It is the producer's duty to know exactly what he sells, and he does know. It is the dealer's duty to know what he buys, and he generally does know. It is the consumer's right to know what he eats and he usually don't know, but he has a right to know, and that right is just as exalted as his right to "life, liberty and the pursuit of happiness." And in fact they are inter-dependent upon each other to a material extent, and no man has authority or privilege to abate those rights one jot or one tittle.

That some do attempt to mislead and deceive is undeniable. And it is the object and duty of the law to protect the consumer from imposition and the fair and honest producer and dealer from unfair or dishonest competition.

That these laws are in the interest of public health and sound public morals and made for the good of all, are based upon simple and exact justice to all, no man can successfully deny. And I believe when the laws are properly enforced, they will not only give satisfaction to all concerned, but will bring the trinity of blessings of health, happiness and longevity to our people.

To the fair and careful enforcement of these laws I shall spare no effort. I shall take a special interest in fixing the responsibility for adulteration where it properly belongs and shall exercise my best judgment "to make the punishment fit the crime."

Fully appreciating as I do, the many difficulties and the immense responsibility, I pledge to the people of Ohio, who have so greatly honored me, my sincerest and most determined efforts.

BUSINESS METHODS AS APPLIED TO THE DAIRY.

By HARMON AUSTIN, WARREN, O.

[Read at the meeting of the State Dairy Association, Columbus, January 13, 1897.]

If you talk with anyone but the farmer, you will be told that what the farmer needs is to employ ordinary business sense and he will be successful; and in proof of his statement he will cite a few men who have been, and are, making farming pay. Most of these men will be dairymen and it is our purpose this evening to see if we can discover wherein their success lies. What are the elements of their success?

ANALYSIS OF BUSINESS METHODS.

Wherever you see a successful man, you find above all, good common sense, that quality which keeps you on the right track and prevents you from making a fool of yourself by following this or that hobby. He will also be industrious and energetic. He will inform himself in all matters pertaining to his trade, and keep such records of his own business as to enable him at all times to know where he stands, and what his product costs in every detail. He will not try to divide his energies, but reserve his forces for the more perfect execution of the work in hand. More and more each year are all lines of business becoming specialized.

WHAT WOULD SUCH A MAN DO UPON A DAIRY FARM?

Let us then for a few moments try to see how such a man would conduct his dairy.

Dairying is changing from day to day. Each year brings something new of importance and advantage. Thus our dairymen must be well posted and abreast of the times. Hundreds of thousands of dollars are spent each year to teach us the whys and wherefores and to determine the best methods. Hundreds of competent men are constantly studying and experimenting for our benefit. All this information is free to us, for the asking and the trouble of reading. In no other line of business is there so much done by the various state and national governments. While there is none too much of this work done, there is a very scant appreciation of its value. Many object to scientific farming, on the ground that it is not practical. Science may best be explained as classified knowledge. Then certainly the more science on the farm, the better results. We can no longer hope to farm as our fathers did and have any profit. We must do as every other industry has done, we must advance, we must take advantage of every new truth discovered, of every new factor and turn it to our advantage. The conditions of supply and demand are constantly changing. Put yourself in a way to become familiar with these and to turn to your own profit any change that may come.

THE FARM.

Turning to a practical application of these ideas, we should expect, in the first place, to find the farm properly divided into a regular crop rotation, planned with special reference to the demands of the cow. There should be fences around the permanent pasture fields, but there is little need of wasting land and money to build fences around every small field. As nearly as possible, have your plowed ground laid out in long lands to avoid turning so often in plowing, harrowing, seeding, cultivating and harvesting.

BARNs.

The barns should be built with reference to the business. First, should be considered the comfort of the cow; in all your planning for your cows, let "comfort" be the watchword. This will necessitate a warm barn well ventilated; the internal arrangement so planned as to save labor in handling and feeding the cows. This will depend on the relative position of buildings, etc. Adapt your barn to your conditions and you will be satisfied. To those contemplating building, I would strongly urge that they investigate the advantages of the round or octagonal barns.

THE COW.

The cow is the dairyman's means of converting the raw material into the concentrated product; we must then be sure that we have an economical machine. Here we can learn a very important lesson from successful manufacturers. You are all doubtless familiar with many factories that have been completely remodeled, the old machines thrown out and new ones introduced. This they have been compelled to do to keep within the profit line of their business. Those who failed to recognize the need for a change have either died or been ruined by their expensive machinery. No man can long live in any business where the cost of production exceeds the price received. The advent of the dairy cow—I now refer not only to the pure bred Jerseys, Guernseys, Holsteins and Ayrshires, but to the so called, common cow of distinctively dairy ability—has brought just such a change in the butter and milk business. She has led some on to the road of profit, while those who have still clung to the combination beef and butter animal find themselves on the road to ruin. The price of goods is always made by those who can produce the cheapest, and I do not expect, nor do I desire, the time to ever come again when there will be any profit made from the butter produced by the so called "beefy animals." There is a difference of over 300 per cent. in the cost price of butter from these two classes of cows. No manufacturer could afford to keep three machines in use when he could

procure one to do the same work at one-third the cost. It is no exaggeration to say that many dairymen are doing just this thing, and until they realize their error and procure the better animals they can never make ends meet. The production of the dairy herds at Chicago opened many of our eyes, and affords us an object lesson and a goal for which we must strive. Many herds in Ohio are to-day paying a handsome dividend over cost of care and feed. No man has any business in him who will retain any other upon the farm.

MILK RETAILER.

If you are producing milk for the retail market you should seek that class of cows that will give the largest flow of milk to meet the demands of your customers. You cannot afford to give 18 per cent. of solids in competition with 12 per cent. solids. If you have better milk you should receive a correspondingly better price. Be honest in your dealings, but remember that charity begins at home. If you are working for butter and cheese, secure cows that will produce the largest total amount of solids for foods consumed, always bearing in mind the product in relation to its cost.

FEED AND CARE.

Always paying due consideration to palatability, the feed of a cow should be determined by its cost, either the cost of producing it upon the farm, or buying it upon the open market. We have found, at home, that as long as the cows were provided with the proper proportions of protein, carbo-hydrates and fat, there is little difference whence these ingredients came. Here it would be proper to say a word about the standard or balanced rations. No keeper of cows can afford to ignore the teachings of the scientists on this point. In our own herd (forty-five cows), we effected a saving and profit of two dollars per day in less cost and increased production by conforming our rations to the standard. Do not be misled into the mistake of giving a cow exactly two and two-tenths pounds protein, twelve and five-tenths carbo-hydrates and six-tenths fat, regardless of appetite and production. Our teachers do not advise that. But starting with this as a basis, watch each cow's flow of milk and its quality, too; then as she shows a capacity to do more or less, let her have more or less feed. Watch her condition and if she seems to be losing too much flesh, add a little more carbo-hydrates and fat, and, *vice versa*; if she is gaining too much flesh, take these elements from her food. The feeding of cows is a study, and should always be done by one who knows and can detect every little change and can interpret it. To the feeder, more than to any other, belongs the credit or blame of the success or failure of the cows. Poor feeding is expensive and profitless, while intelligent feeding should produce full pails and full pockets.

CORN AND ROTATION.

In Ohio there is no crop that will produce so much feed, at the same cost, as the corn plant. Wise management would then teach us to make the greatest possible use of corn, both as a winter and summer feed. The silo offers the most economical means of preserving the crop in the best condition for the cow, but it is not best to enter into a discussion of its merits here. What is best to grow in connection with corn will depend largely upon the demands of the local markets. If there is a large demand for oats and good timothy hay, I would advise that they be raised and exchanged for the products of the mills; where such a demand does not exist and there is a small chance for profitable exchange of feeds, the dairyman should grow such feeds as best meet the demands of the cow. In such a case, oats and clover will meet the requirements very well if a little oil or gluten meal can be used in connection with them. As so many are finding difficulty in raising clover, I would call your attention to the suggestion of Professor Henry and others, that

clover can profitably be grown without a nurse crop—giving the land entirely to clover. For this the land should be prepared as for any crop and sown early in the spring, or preferably in Northern Ohio, the ground should be well plowed and harrowed in the fall and given a top dressing of manure, and the seed sown on the frozen ground in March. If weeds get a start, they should of course be clipped off before going to seed. In this way rather poor ground will produce clover and afford a small crop the first season and insure a good catch and crop the next. Whether oats should be exchanged for other feed will depend entirely upon prices of each and cost of exchange. Let the dairyman ever be alert to these things and ready to take advantage of a good sale and purchase. The advantages of a corn, oats, clover rotation, are, that they furnish very nearly the proper ration for our cows, and that it is not a constant drain upon the fertility of the land, but in the clover is found a means of building up the land, and this must be done to gain the largest profits. A large dairy well fed, manure properly saved, and the rotation suggested, should add ten per cent. each year to the fertility of the farm. Those who sell milk should bear in mind that they are every day carrying away some plant food (estimated at ten cents per one hundred pounds of milk), and should buy some highly nitrogenous food to replace said fertility. Good business economy will dictate buying fertilizer in feeds rather than commercial fertilizers. The richer the feed, the better results in milk, and with tight floors and manure properly saved, a double return may be secured from the purchased feeds. I have in mind a small farm on which there were thirty-five acres of used up land: these thirty-five acres have in three years been made to produce over one hundred bushels of corn per acre by following the plan outlined.

STATISTICS, THEIR VALUE AND USE.

There is nothing more important for the dairyman than accurate records of what his cows are doing each day. Without it all is more or less guess work, and likely to lead to grave mistakes. Good business judgment demands that we make each individual cow stand upon her own merits and not be helped through by the average maintained by having some extra good cows. We must know which are the bad and which are the profitable cows. This can only be done by a daily record of milk produced, with occasional resort to the Babcock tester to show the amount of fat produced. I do not believe that there is a dairyman here to-night, who can give an accurate idea of what his cows are doing unless he employs some such method. The veteran Illinois dairyman, H. B. Carler says, that when he began weighing each milking, he was compelled to admit that one large fine cow he had always considered his best cow, was not what he had thought, and was really unprofitable, and that a small grade Jersey that had never given a large flow of milk, was in reality his best cow. A young New York State dairyman reported to Hoard's Dairyman that his herd had averaged three hundred pounds of butter per cow, but that if he had sold five of his herd at the beginning of the year, he would have saved all the labor attending them, and been one hundred dollars better off at the end of the year. This has been my own experience, and had it not been for the scales and Babcock tester I should to-day have some unprofitable cows that have gone to the butcher, while I fear that the butcher might have obtained some that the accurate records have shown to be profitable producers.

INCIDENTAL ADVANTAGES.

There are many incidental advantages to be gained. First, it is a constant guide to intelligent feeding, and will indicate to the careful feeder whether this or that cow makes the best use of her feed. One little incident to explain this. About a year ago I brought home one lot of six cows and another lot of eight cows. The

first lot were large, weighing at least twelve hundred pounds each, while the others were registered Jerseys. The larger cows were bought with the idea of selling as soon as their flow of milk should become too small to be profitable. These two lots were carefully watched, both as to production and cost of feed. Though the large cows were all just fresh, and the Jerseys were several months from their calves, I found that comparing cost of feed the twelve hundred pound cows were not profitable, even though they were averaging forty pounds of milk per day and nine pounds of butter per week. What we must figure on is net profit and not gross sales. Such a daily record is also a constant indication that something is wrong with the cow, and needs attention.

SUMMARY.

In closing, then, good common business sense would teach us that the dairyman who would succeed must keep himself well informed; will have farms and barns arranged with reference to the object in view; will have the cows adapted to the purpose in view, and keep such records as will at all times show their worth; he will feed these cows in proportion to their ability to pay for same, and the cheapest and best balanced rations.

TAINTED MILK.

By H. J. NOYES, Assistant Professor of Dairying, Ohio State University.

[Read at the meeting of the State Dairy Association, Columbus, January 13, 1897.]

Tainted milk is the great bugbear with which cheese makers have to contend; it causes more anxiety and mischief than any other one thing known to the trade. If dairymen could be made to understand its effects they would anxiously search for the causes, because it would mean money in their pockets.

For instance, while ten pounds or less of good milk will make a pound of cheese, it requires eleven or twelve pounds of tainted milk, for a tainted or gaseous curd requires more acid, which takes more time to develop, thus driving out the moisture and butter fat. Therefore, the yield is greatly diminished. The loss does not end here, for the cheese is quite likely to be sold at a lower price, for although (with proper treatment) a solid article may be made, the desired flavor is lacking.

But most men who deliver milk at a factory (if it passes the maker's nose without comment or at most a mild warning from him to take better care of his milk) go home without concern, and if the cheese or butter does not bring the highest market price, they blame the manufacturer, and it never occurs to them that their own carelessness has the least thing to do with it.

There are so many sources of tainted milk that it requires great intelligence sometimes to detect them; but the most common is lack of cleanliness and proper aeration. Let me give you the results of an experiment made in the month of October of the mixed milk of the university herd at the experiment farm at Madison, Wisconsin. Taken under ordinary conditions it contained 15,000 germs, 500 per cubic centimeter, while of a cow that had been carefully cleaned and the milking done in a cleanly manner, having the udder and hands clean and moist, only 330 bacteria for the same volume were found. A repetition of the same experiment in February under winter conditions revealed 7,680 germs per cubic centimeter in the milk obtained without special precaution, while the number in the milk that had been taken with care was reduced to 210 germs per cubic centimeter, the bacteria derived from the filthiness causing tainted milk.

When bacteriology is better understood there will not need to be so much said and written about this subject of cleanliness. What I say is a repetition of what has been said and written again and again and will keep on repeating it until the object is obtained.

Go into the operating room of a hospital and ask the surgeon to explain to you

why so much care is taken to keep everything in the room so scrupulously clean and every precaution taken that there be no contamination. He will explain to you the danger of germ poisoning and how easily they are transmitted. If a few chance to lodge on the surgeon's knife it means death to the patient by blood poisoning. How careful then ought we to be with that which we eat. There is no article of food which is so easily contaminated as milk, nor any so carelessly handled. Men will go about their milking without a thought of washing their hands, no matter what kind of work they have been doing, brush the cows' udders carelessly, enough to set the dust and dried filth flying about in the air, which finally settles in the milk pail and there, in the warm milk, they find just the conditions for multiplying a thousand fold. Then perhaps the milk is strained through a carelessly washed strainer into a can which may be visibly clean, but in the seams and joints numerous germs are imbedded which a common washing and scalding will fail to dislodge, and oft-times the can stands near enough to the stable to take on more taint. When the weather is sultry much greater care is needed, for in such weather the germs multiply much faster. Let it be well aired, then cooled immediately to 60 degrees or below, for in a cool temperature the germs lie dormant and will have little effect on the milk.

We have all heard of ice cream and cheese poisoning; it is my belief that these poisons are caused by tainted milk in the worst form. W. E. Hurd, dairy and food inspector, says: "In all cases of poisonous cheese which have come to my knowledge traces of dangerous milk were found entering into the manufacture of such cheese; and almost, I think always, in cheese of very open texture or porous. Instead of the cheese maker being to blame for fermenting his curds too much or allowing too much acid to develop, I believe that to be the only remedy whereby the dangerous element can be dislodged. If, as Dr. Vaughn says, the poison is so volatile, then a thorough aeration of the curd separate from the whey would make it possible for the poison to disappear before pressing. Some one has said "Eternal vigilance is the price of liberty." So I would say to the cheese makers of America, eternal vigilance on your part will, I believe, wipe out this tyrotoxicon scare. Watch your milk more closely and if enough putrid milk creeps in to cause floating curds or other similar indications, throw the curd away; do not take the chance of marketing it and thereby possibly injuring your reputation, the reputation of your factory, and the great cheese industry of the world."

In addition to what Professor Hurd says in the treatment of the curd I would add, while the acid is developing I would mat and pile it until the gas is expelled by the pressure, then by milling and aerating a solid texture is obtained and the cheese will not huff. I have seen milk so badly tainted that the whey would be of a greenish color and foam; the curd would be so full of gas that it would float. After working in such a vat the hands would prickle and become swollen. Before I had learned how to handle such milk the cheese would begin to huff as soon as the screw to the press was loosened, and continue to swell sufficiently to raise the followers from the hoop. They would crack open and gas escape. No wonder tyrotoxicon could be found in such cheese.

Some of the reasons for tainted milk are as follows: Cows drinking from stagnant and muddy pools of water and dragging the udders through it, when the germs will adhere to the latter, and will be dropped into the milk pail; dirty, stinking barns, stinking water tanks where milk is cooled; cows in heat, sick cows; poorly ventilated, stinking air where the cows are milked; milk kept too long in foul air before being aerated and cooled; the use of wooden buckets for milking; lack of sufficient care in aerating and cooling; cooling and aerating the milk near contaminated places, such as the hog pen. I have known of milk being badly tainted by cooling in cistern water which stunk. The patron discovered the cause one morning by using some of the water when making preparation to shave his face.

The presence of gas or taint in cheese is recognized by small round holes called pin holes, and when cheese are made by the granular process there is no way of ridding the curd of this gas, but it will go on developing on the shelves and will never command a good price in market. Such cheese disgusts the consumer and destroys his taste for cheese, whereas if nothing but a good article was to go on the market the demand would be so great that there would be no danger of over-production. And when we consider that there is about twice as much nutritive value in a pound of cheese as there is in a pound of beef, it ought to stimulate the producers of milk to furnish nothing but the best. Then do not make the mistake of hiring a poor cheese maker because you can hire him cheap, for he would be dear at any price, but get a good man who understands his business thoroughly. When a pound of cheese can be bought for about the same price as a pound of beef it ought to be found on every table, especially that of the workingman, and it will be when properly made.

Annual Meeting

Ohio Draft and Coach Horse Breeders' Association

HELD AT

Department of Agriculture, State House, Tuesday Evening,
January 12, 1897.

ADDRESS OF THE PRESIDENT.

PROFESSOR THOMAS F. HUNT, Ohio State University.

This Association at its last annual meeting, appointed a committee consisting of your president, your vice president and your secretary to prepare and cause to be introduced and passed by the Ohio Legislature a bill to license and regulate the use of stallions within the state. In place of a formal president's address it has seemed to be wise to take the time to report the efforts the committee made in the matter.

Our meeting occurred and your committee was appointed January 14, 1896. At an early date thereafter your committee prepared a bill and secured an informal hearing before the committee of agriculture of the House of Representatives. To this committee was presented a bill which had been agreed upon and each member of your committee spoke in behalf of the measure. The measure was freely and fully discussed by the several members of the committee on agriculture and other members of the House who were present. One member of the House of Representatives, Mr. Moore, of Monroe county, although not a member of the committee, took strong position against the revenue feature of the bill on the ground that it was not constitutional. Otherwise the gentleman was heartily in favor of the bill. After this informal discussion, Mr. S. K. McLaughlin, of Harrison county, took the bill in charge and upon Friday, February 21, 1896, introduced the bill prepared by your committee, which was known as H. B. No. 445—Mr. McLaughlin.

The bill was as follows:

A BILL

To improve the stock horses in Ohio and discourage the use of unsound stallions.

SECTION 1. Be it enacted by the General Assembly of the state of Ohio: That the owner of any stallion intended for public service of mares in Ohio shall take out a certificate for one year from the county auditor of the county in which said stallion is kept for service, and shall pay the county auditor the sum of twenty-five dollars for

the same, which sum shall be paid into the county treasury for the use and benefit of the general fund of the county; and the auditor shall keep a record of all stallions so certified, giving date of certificate, name of owner and his postoffice address, name of stallion, and if registered, his register number and the name of stud book.

SECTION 2. Before receiving said certificate the owner shall present a sworn statement from a qualified veterinarian that the stallion is free from roaring, ring bone, spavin, periodic ophthalmia (moon blindness), navicular arthritis (disease of navicular bone), or any transmissible disease, and is bred as claimed in bills advertising the stallion or claimed otherwise.

SECTION 3. That the keeper or owner of any stallion failing to take out a certificate as provided in sections 1 and 2 of this act, or misrepresenting the breeding of the stallion, shall be liable to a fine of not less than twenty-five dollars nor more than one hundred dollars, to be collected in the name of the state of Ohio before any justice of the peace in the township in which the person so violating shall reside, and said fine shall be paid into the township treasury for the benefit of the public school fund. And it is further provided that no person breeding mares to such stallion shall be liable to owner for service fees.

SECTION 4. This act shall take effect and be in force from and after August 1, 1896.

It was read a second time on February 24th, and referred to the committee on agriculture on Friday, March 20, 1896. Mr. Samuel Lewis, of Delaware county, reported the bill back to the House on behalf of the committee, as follows: The standing committee on Agriculture, to which was referred H. B. No. 445, Mr. McLaughlin, having had the same under consideration reports it back with the following amendments and recommends its passage when so amended: In line five after the word "of" strike out the word "twenty-five," and in lieu thereof insert the word "ten." After the word "book," in line ten, insert the following: "The auditor of state shall prescribe the form of such certificate and furnish a copy of the same to each of the county auditors of the state."

The bill was ordered engrossed and read the third time on the following Monday. On March 25, 1896, the bill was read the third time and then Mr. Moore, of Monroe, moved to refer to a committee of one for the purpose of reducing the license fee to five dollars. The motion was disagreed to. The bill was then put upon its passage. There were 49 votes for and 10 against; 57 votes being required, the bill failed.

On March 27, 1896, on motion of Mr. McLaughlin, a reconsideration was secured. The question being upon the motion of Mr. Moore to refer with instructions to amend, further consideration of the bill was postponed until the following Monday.

On April 9th, the bill was taken up and Mr. Moore's motion to amend so the license fee should be five dollars instead of ten was agreed to.

The bill was again placed upon its passage and resulted in 55 yeas and 11 nays. The bill thus failed for lack of two votes.

Your president hopes that this brief statement of the fate of this bill may be helpful to future committees of this Association in their endeavors to secure a bill which shall improve the stock of horses in Ohio and discourage the use of unsound stallions.

I do not purpose to insult the intelligence of this Association by any arguments in favor of such a bill, but to my mind the strongest argument in favor of such a bill is the difficulty this Association has in securing the passage of such a measure. It is the strongest kind of argument that many unsound stallions are being used to perpetuate the horse stock of Ohio.

HOOF NURTURE.

By DR. D. S. WHITE, Dean of the College of Veterinary Medicine, Ohio State University.

[Read at the meeting of the Draft and Coach Horse Breeders' Association, Columbus, January 12, 1897.]

Although ordinarily the terms "foot" and "hoof" as applied to the horse are confused, technically speaking, the foot is the lower portion of the leg and includes the lower end of the shin bone, the fetlock joint, the pastern bone and those bones, ligaments, tendons, blood vessels, nerves, etc., encased by a horny box at the most distal part of the limb. This horny box or shell, analogous to the fingernail in man, is called the hoof. The hoof is separable into three distinct parts—first, the wall, which is that portion forming the front and sides of the shell, to be reflected forwardly and inwardly at the heels as two strengthening rods of horn appearing upon the volar surface of the hoof. This reflection of the wall is known as the bars. The wall of the hoof, unlike the upper of the shoe of man, to which it is commonly compared, comes in contact with the ground. The sole is the floor of the hoof and is wedged in between the walls and bars, having behind a V-shaped excision to receive their portion or frog. The frog is a pyramidal shaped mass of soft, elastic horn, its apex directed forward into the angle formed by the bars which separate it from the sole. Its base becomes lost behind in what are known as the balls of the foot. The hoof horn is secreted by the continuation of the skin of the body under the shell, which covers the underlying tendons, bones, etc., like the sock on the human foot. Horn is simply modified hair. Though to the casual observer the hoof may appear a simple piece of anatomy, if we study carefully its parts as to position, physiological action and mechanism, we will find it to be one of the most complex, but most beautifully arranged apparatus of the whole animal body. "The hoof is one of the Creator's masterpieces," has been exclaimed. To treat of its varied parts and their relationship to one another would require too much space and lead far beyond the purpose of this article. Situated as the hoof is, it must necessarily be exposed to all kinds of mechanical and chemical insults, such as the effect of concussion, heat, cold, mud, etc., from the roadways, and the action of fermenting urine and excrements from uncleanly stables. Horn, however, is strong and elastic and a poor transmitter of heat and cold; otherwise the hoof's functions would soon become so impaired as to make the animal of which it forms a part unfit for service. At best, about 90 per cent. of the lamenesses of the horse find their seat in the hoof, and as nearly one-half of all our horses after five years' usage, become crippled through lameness, reducing not only their commercial value, but rendering them objects worthy of the pity of humanity, it must seem that the care of the hoofs ranks only secondary in importance to proper feeding and stabling.

The care of the hoof should begin with the foal. It is best to allow the colt abundant exercise upon dry, but not strong ground. The hoofs then are worn off naturally and usually evenly. In case there should be any irregularities in the wearing off process a few well directed raspings with a blacksmith's file will set all aright. If colts are kept up in stables, however, as is the case in winters in the North, the wall horn, which is constantly being produced from above, does not become worn away and there result changes in the hoof's form. The wall becomes too long (high), distorted, or the layers of horn of which it is made up become separated, inducing a condition known as "hollow wall." The wall at the quarters (toward heels) becomes bent around under the hoof and over the sole, encroaching upon the space of the frog, leading to an anomaly that we call "hoof-bound." Then the toe of the hoof grows out too long, causing the pastern bone to stand too perpendicularly and the gait to be unsteady and stiff. The colt "walks as if tread-

ing upon eggs," we say. To prevent these abnormalities, the hoofs should be shortened from time to time with a hoof-knife and the wall, which has become bent around over the sole, pared away. The outer edges of the wall, coming in contact with the ground, should be rounded off carefully to prevent a splitting or slivering of the horn.

Some hoofs have a tendency to grow crooked, especially in young colts. We can do much toward straightening these distorted feet by paring and rasping them until they assume the normal form. We must always bear in mind, however, the attitude of the legs, i. e., the leg direction with reference to the body. When paring the hoofs, for instance, it would not be well to try and make the outer and inner sides of the wall of equal length (height) in a colt or horse whose legs assumed a "knock-kneed" or "spray-footed" attitude, for, naturally, in this case, the inside wall is lower than the outer. In very young animals even irregularly shaped legs can, in a great measure, be adjusted by judiciously paring and rasping the hoofs. Next to keeping the hoof in its correct form comes moisture and cleanliness, as essential to its proper nurture. Frequently washing the hoofs in clean water and allowing plenty of good straw bedding will usually supply these requirements. Shoeing colts too young interferes greatly with the growth of the hoofs. It prevents the natural expansion and contraction of the horny shell, impairing the free circulation of the blood through the horn producing tissue underneath. Young shod colts, too, are often over driven and prematurely ruined. Light farm work can do a colt no harm, and for such work shoeing is not necessary.

The shod hoof of the adult horse requires even more care than that of the bare-footed colt. Shoeing at best is an evil, but to protect the hoof from abnormally wearing off upon hard, stony streets, it must be resorted to. By nailing a ridged piece of iron or steel to the shell of the hoof's mechanism the expansion and contraction the hoof undergoes by the horse's treading upon the ground and raising the foot again is interfered with, the free circulation of the blood is slackened, the growth of horn diminished, and, consequently, in time, every shod hoof becomes atrophied (shrunk). Added to this, the keeping of the animal tied in a stall, allowing insufficient exercise, uncleanliness, bad bedding and not enough moisture all tend to augment this detrimental influence. In horses kept much of the time in stables, especially the front hoofs must suffer. The hind ones are dampened by the excrements and urine. An uneven flooring of the stall exhausts the limbs and fermenting droppings among the straw bedding leads to the development, most commonly in the hind hoofs, of a disease called "thrush."

The principal indications in caring for the shod hoof are to ameliorate as much as possible the bad effects of the shoeing and the keeping of the horse standing in tie-stalls in the stable. In the first place, much can be done by having the shoes removed every four or six weeks and the hoof shortened and properly pared into correct form. The popular belief so prevalent among horseshoers to have "plenty of foot (horn) under the horse" is a grave error. In race horses, where everything is sacrificed to gain speed, there may be arguments in favor of allowing the hoofs to grow out to an abnormal length to gain distance at each stride. Such a procedure must, however, in time, lead to diseases of the foot, i. e., tendons and joints. Secondly, moisture and cleanliness. These can be supplied, as has been shown, by allowing plenty of dry straw and daily clearing out the hoofs with a "foot hook" and washing with water. This will prevent thrush in the hind hoofs and will permit the front ones to absorb enough moisture to make them elastic. Moisture is very essential to the mechanism respectively to the development of the bone constantly being formed.

To prevent the evaporation of the water from the bone, a smearing of the hoof with fat is beneficial. This is especially of advantage when the hoofs are not washed daily. One needs to use only a small quantity of fat, which can be applied with a rag

over the upper part of the wall (near the hair) and over the frog and sole. It requires no specific formula nor patent hoof ointment. Pure lard, lanoline or good vaseline suffice. Glycerine should never be applied to the hoof, as it tends to dry it out. Salves should never be put on a dirty hoof; their application must always be preceded by washing. The reason for this is that the dirt and fat together form a crust, under which the horn crumbles away. No ointment can directly stimulate the growth of horn, though some may contend to the contrary. In very wet weather or where the streets are covered with snow or slush, the addition of a little turpentine or wax to the lard is desirable, as it prevents the horn from becoming too soft.

When the hoof is properly treated by washing with water and smearing with fat in the manner indicated, the natural color and tubular structure of the horn is everywhere seen. Finally, moderate exercise is required by the hoof. This furthers the circulation of the blood within the horn secreting tissue and hence the production of a better quality and quantity of horn. Horses that work, therefore, have usually better hoofs than those which stand most of the time idly in their stalls.

Inasmuch as shoes are injurious to the growth and development of the hoof horn, it is indicated to remove them whenever the horse is laid off from work for any length of time. Of course, it is understood in this case that the hoof's condition will permit of it.

Law Governing Farmers' Institute Societies in Ohio.

[PASSED APRIL 26, 1890, AND AMENDED APRIL 27, 1896.]

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio, That* when twenty or more persons, residents of any county in the state, organize themselves into a farmers' institute society, for the purpose of teaching better methods of farming, stock raising, fruit culture and all branches of business connected with the industry of agriculture, and adopt a constitution and by-laws agreeable to rules and regulations furnished by the state board of agriculture; and when such society shall have elected proper officers and performed such other acts as may be required by the rules of the state board of agriculture, such society shall be deemed a body corporate.

SECTION 2. Not to exceed four farmers' institute societies organized under the provisions of this act, shall hold annual meetings under the auspices of the state board of agriculture in any one county in the state, and the state board of agriculture shall have power to determine the number and name the times and places for holding such institute meetings.

SECTION 3. When a society organized under the provisions of this act shall have held its annual farmers' institute meeting in accordance with the rules of the state board of agriculture, the secretary of the said board shall issue certificates, one to the president of the farmers' institute society and one to the president of the state board of agriculture, setting forth these facts and, on the presentation of these certificates to the county auditor, he shall each year draw orders on the treasurer of the county as follows: based on the last previous national census, a sum equal to three mills for each inhabitant of the county in favor of the president of the state board of agriculture, and a sum equal to three mills for each inhabitant of the county in favor of the president of the farmers' institute society, where but one society is organized, but in counties where there are more than one farmers' institute society organized under the provisions of this act, and holding meetings under the auspices and by the direction of the state board of agriculture, the said three mills for each inhabitant shall be equally apportioned among such societies, and warrants in the proper amounts issued to the respective presidents, and the treasurer of the county shall pay the same from the county fund; provided that in no county shall the total annual sum exceed two hundred and fifty dollars; and provided further, that the payment to any institute society shall not exceed the expense, as per detailed statement, provided in section four of this act.

SECTION 4. With each certificate of the secretary of the state board of agriculture to the county auditor (which certificate shall indicate the number of societies organized in the county and holding meetings by direction of the state board of agriculture, and before the auditor issues his order upon the treasurer), there shall be filed with the auditor a detailed statement of the expenses of the institute for the current year, no part of which shall be for salaries of officers of the institute society

but this provision shall not apply to the order in favor of the president of the state board of agriculture, which board shall issue statement as required in section six of this act.

SECTION 5. At the annual farmers' institute meetings, held under the provisions of this act and under the auspices of the state board of agriculture, the said board shall furnish lecturers or speakers whose compensation and expenses shall be paid by the board.

SECTION 6. At the close of each season's institute work, the state board of agriculture shall publish in pamphlet or book form, such lectures and papers delivered at the several institute meetings, as may seem of general interest and importance to the farmers, stock breeders and horticulturists of the state, copies of which shall be furnished the secretary of each institute society, and the balance issued to be for general distribution; the cost of preparing the matter and the distribution of the pamphlet or book to be paid by the state board of agriculture. Said board shall also publish, in such pamphlet or book, a detailed statement of its receipts under the provisions of this act and the disbursements on account of institute work.

SECTION 7. Said original act, entitled "An act to provide for the organization and support of farmers' institutes," passed April 26, 1890, is hereby repealed and this act shall take effect and be in force from and after its passage.

Rules.

Of the Ohio State Board of Agriculture for the Organization and Management of Farmers' Institute Societies, adopted May 26, 1896.

SECTION 1. Parties who contemplate organizing Farmers' Institute Societies and Farmers' Institute Societies already organized desiring to hold meetings under the auspices of the State Board of Agriculture, in accordance with the act of the General Assembly of Ohio, passed April 26, 1890, and amended April 27, 1896, must first present a petition to the State Board of Agriculture for the same, signed by twenty or more residents of the county, without regard to sex, but all signers must be of legal age. In order that the Board may act intelligently on such petitions, the petitioners should furnish replies to question propounded by the State Board of Agriculture concerning proposed place of meeting, capacity of hall or building to be occupied, railway facilities, etc. Blank petitions with the questions to be answered will be furnished on application, by the Secretary of the State Board of Agriculture, at Columbus.

SECTION 2. Said petitions should be filed with the Secretary of the State Board of Agriculture not later than the first day of September of any year. Earlier presentation will greatly facilitate the work of the Board in considering applications and assigning dates and speakers. Petitioners will be promptly notified of such action as the State Board of Agriculture may take.

SECTION 3. After the petition for the holding of an institute meeting shall have been granted, the petitioners will proceed to organize, if not already organized, by the election of a president, vice-president, secretary, treasurer and an executive committee of three (the president and secretary to be ex-officio members of this committee making a committee of five), all to serve for the period of one year or until their successors are duly elected. After the first organization an election of officers shall be held during each annual institute meeting, only members of the society being entitled to vote. Of the officers, not more than two shall be elected who are residents of the same township. The society shall adopt a constitution and by-laws in harmony with the institute law of the state and these rules.

SECTION 4. As soon as an organization is completed it shall be reported to the Secretary of the State Board of Agriculture, with the name of the society, and the names and post office addresses of the officers and a copy of the constitution and by-laws.

SECTION 5. The secretary of each institute society shall keep in a substantial book or books a record of all meetings of the executive committee and society, and a roll of the members, with the post office address of each; first, the original petitioners for the organization, followed by residents of the county or locality, of legal age, who, by enrolling their names in the secretary's book, become members of the society.

SECTION 6. When a petition has been granted, and the society notified of the date assigned for its institute meeting and the lecturers to be furnished by the

State Board of Agriculture, the executive committee shall proceed in due time to make arrangements for the institute meeting, by engaging hall, selecting the local talent desired, arranging for music and all other details necessary for the successful holding of a farmers' institute meeting, and preparing a program which shall occupy the time assigned for the meeting. In arranging the program, time shall be allowed for discussion of the topics presented and for miscellaneous questions. The speakers sent by the State Board of Agriculture are to occupy not more than half the time of the institute meeting, and local talent, discussions and music the remaining time. The program should be published for general distribution at least two weeks in advance of the institute meeting, and at the same time a copy mailed to the Secretary of the State Board of Agriculture and to each speaker who is to take part. Societies should thoroughly advertise and use diligence and enterprise to create an interest among the people and to secure the largest possible attendance. Every citizen of the county and locality ought to be informed as to the time, place and nature of the institute meeting. The executive committee shall have full authority to audit and settle all accounts made for and in behalf of the institute society.

SECTION 7. All institute societies organized under the institute law of the state shall be strictly nonpartisan and nonsectarian in every phase of their work, and no institute shall be conducted in the interest of any party, sect or society, but for the equal good of all citizens and farming communities.

SECTION 8. The presiding officers of the various institute societies of the state, holding meetings under the auspices of the State Board of Agriculture, should always and under all circumstances prohibit discussions of subjects other than those pertaining to agriculture, horticulture stock breeding, etc.; anything of a sectarian or partisan character should not be discussed or commented upon either by speakers or members of institute societies; no criticism of state, county or township officials should be tolerated under any circumstances.

SECTION 9. No fee shall be charged for admission to institute meetings held under the auspices of the State Board of Agriculture, they shall be public and free to all, the object being to impart agricultural knowledge and experience free to all persons sufficiently interested to attend. If any society desires to hold quarterly, monthly or weekly meetings during the year, the expense of the same may be met by admission fees, subscriptions, collections or sale of season tickets. Nothing in this section shall prevent voluntary contributions or subscriptions for securing speakers desired other than those sent by the State Board of Agriculture.

SECTION 10. Within ten days after the close of each institute meeting, the secretary shall make a report to the Secretary of State Board of Agriculture, blanks for which will be furnished. On receipt of such report by the Secretary of the State Board of Agriculture he will issue the certificate, according to law, which will enable the society to draw the amount due from the county.

SECTION 11. A society or its executive committee may, on the call of the president, hold such business meetings as may be necessary to transact the business of the society and arrange for the annual institute meeting to be held under the auspices of the State Board of Agriculture; and the traveling expenses of the executive committee for such meetings may be paid as other items and charged with other expenses of the institute.

SECTION 12. When the secretary of a farmers' institute society shall send a written report to the Secretary of the State Board of Agriculture, as provided by section ten of these rules, he shall state the cost of the institute meeting (not including expense of speakers sent by the State Board of Agriculture), number in attendance during the institute meeting, speakers who filled appointments, speakers absent, whether speakers were acceptable or otherwise, and report any feature or matter of special interest.

SECTION 13. The State Board of Agriculture requires that lecturers employed by the Board shall devote their time and efforts to the discussion of such subjects as are clearly provided for by the institute law of the state, namely, "Farming, stock raising, fruit culture and all branches of business connected with the industry of agriculture."

THIRTIETH ANNUAL REPORT

OF THE

OHIO STATE

HORTICULTURAL SOCIETY

FOR THE YEAR 1896-7.

ORGANIZED IN 1847 AS OHIO POMOLOGICAL SOCIETY.

Ohio State Horticultural Society.

OFFICERS FOR 1897.

E. H. CUSHMAN, President.....	Euclid, O.
W. R. LAZENBY, Vice President.....	Columbus, O.
W. W. FARNSWORTH, Secretary.....	Waterville, O.
N. OHMER, Treasurer	Dayton, O.

AD INTERIM COMMITTEE.

First District—C. H. WAID.....	Emery, Fulton County.
Second District—N. H. ALBAUGH.....	Tadmor, Miami County.
Third District—A. SHIRER.....	Dayton, Montgomery County.
Fourth District—WM. MILLER.....	Gypsum, Ottawa County.
Fifth District—J. S. HINE.....	Columbus, Franklin County.
Sixth District—E. G. COX.....	Bradrick, Lawrence County.
Seventh District—E. M. WOODARD.....	Kirtland, Lake County.
Eighth District—H. H. AULTFATHER.....	Minerva, Stark County.
Ninth District—S. R. MOORE.....	Zanesville, Muskingum County.
Tenth District—FRANK FORD.....	Ravenna, Portage County.

STANDING COMMITTEES.

NOMENCLATURE.

W. J. GREEN.....	Wooster, Wayne County.
S. R. MOORE.....	Zanesville, Muskingum County.
W. W. FARNSWORTH.....	Waterville, Lucas County.
E. M. WOODARD.....	Kirtland, Lake County.
WM. MILLER.....	Gypsum, Ottawa County.
M. CRAWFORD.....	Cuyahoga Falls, Summit County.

ENTOMOLOGY.

PROF. F. M. WEBSTER	Wooster, Wayne County.
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FORESTRY.

PROF. W. R. LAZENBY.....	Columbus, Franklin County.
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VEGETABLE PATHOLOGY.

PROF. A. D. SELBY.....	Wooster, Wayne County.
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ORNITHOLOGY.

L. B. PIERCE.....	Tallmadge, Summit County.
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EXECUTIVE.

The President, Secretary and

N. H. ALBAUGH.....	Tadmor, Miami County.
WM. MILLER.....	Gypsum, Ottawa County.
E. M. WOODARD	Kirtland, Lake County.

CONSTITUTION

OF THE

Ohio State Horticultural Society.

First—The Society shall be known as the OHIO STATE HORTICULTURAL SOCIETY.

Second—Its object shall be to select and disseminate information relative to fruits and other horticultural products, and to promote the taste for horticulture and rural embellishments among the people.

Third—Its officers shall be a President, Vice President, Secretary and Treasurer, who shall, in addition to their official duties, constitute a board, empowered to fill all official vacancies that may occur during the year by death or resignation. They shall be elected annually, by ballot, and hold their offices until their successors are elected, but the Secretary shall not enter upon his duties of his office until the first day of August following his election.

Fourth—The President shall preside and conduct all meetings of the Society, and in his absence the Vice President shall perform the same duties.

Fifth—The Secretary shall record all doings of the Society, perform all correspondence, and with the assistance of the President, collate and prepare the annual report and other matters for the public press.

Sixth—The Treasurer shall collect and hold all funds of the Society, and pay out the same only on the order of the Secretary, countersigned by the President.

Seventh—The membership fee shall be one dollar a year, payable in advance, and any person can become a member of the Society by forwarding the fee to the Secretary or Treasurer. All delinquent members shall be notified by the Secretary not later than February 1st, of each year, and shall not be entitled to the annual report of the proceedings of the Society until their dues are paid. If the dues are not paid before January 1st, following, their names shall be stricken from the list of membership.

Eighth—There shall be an *Ad Interim* Committee, consisting of the officers of the Society and ten other members, residents of different sections of the state, representing specific districts, to be elected annually, whose duty it shall be to observe and take notes of new and rare fruits, the fruit crops, and other matters of interest to the Society during the season, in their several sections of the state, and report the same at the annual meeting of the Society. It shall also be the duty of the members of this Committee to solicit membership to the State Society, and to encourage the establishment, and promote the interests of local Horticultural societies in their respective districts.

Ninth—The annual meeting of the Society shall open on the first Wednesday in December of each year, at such place as may be designated by a vote of the Society, notice of the time and place, together with the order of exercises, to be sent in due time to each member, by the Secretary. At this meeting the President will be expected to deliver an address, and the report of the *Ad Interim* Committee, Standing Committees, Secretary and Treasurer, shall be read, and the usual business transacted, besides papers and discussions on horticultural topics.

Tenth—There shall be an Executive Committee, consisting of the President, Secretary, and three other members of the Society, to be chosen by the President from the *Ad Interim* Committee elected at each annual meeting, which Committee shall have general charge of the affairs of the Society.

Eleventh—This constitution may be amended, and by-laws may be adopted for the government of the Society, by a vote of two-thirds of the members present at any regular meeting.

STATE FAIR MEETING.

The State Fair meeting of the Society was held in the hall of Wells Post, G. A. R., Columbus, at 7:30 P. M., Thursday, September 3, 1896.

In the absence of President Cushman, Vice President Lazenby occupied the chair and appointed the following Committee on New Fruits, viz.: Isaac Freeman, Rex; Nelson Cox, Ensee; E. M. Woodard, Kirtland.

Professor Lazenby read some interesting statistics, showing the number of entries of the different varieties of fruits at the State Fair.

The selection of a place for annual meeting being next in order the Secretary read invitations from Delta and also from Athens.

Mr. S. R. Moore moved that we accept the invitation of the Athens County Horticultural Society.

Motion prevailed.

The Secretary urged the importance of publishing our own reports immediately after annual meeting, and offered to dispense with the services of a stenographer in order to do so if the society thought best.

Professor Selby moved that the Secretary publish its reports, independent of the state printing, the coming year.

Dr. Aldrich amended motion to refer the matter to a committee to report to Society at annual meeting in December.

Motion as amended carried.

The sentiment of the meeting seemed to be in favor of employing a stenographer.

Professor Selby said that peach yellows was to be found to a greater or less extent in nearly every county in the State, and stated that he had specimens on exhibition at the Fair.

There seemed to be no differences in the susceptibility of different varieties.

Frank Ford said the Crosby peach possessed excellent quality and hardiness.

The Lemon Free was thought to be a valuable seedling, originating in Summit county. It is very productive and of fine quality.

Professor Green recommended Williams' Cling.

There being no further business the meeting adjourned.

PROCEEDINGS
THIRTIETH ANNUAL MEETING
OF THE
Ohio State Horticultural Society
HELD AT
ATHENS, OHIO,
December 2d, 3d and 4th, 1896.

MORNING SESSION, WEDNESDAY, DEC. 2.

Order was called and Mr. Brawley, of Athens county, introduced Hon. Charles Grosvenor, of Athens, Ohio, who very cordially welcomed the members of the society to the city of Athens. Mr. Grosvenor spoke as follows :

ADDRESS BY MR. GROSVENOR.

Ladies and Gentlemen :

I was requested by a gentleman representing the Horticultural Society of Ohio to make a few remarks at the opening of your annual meeting. I extend to you on behalf of the citizens here a very cordial welcome to our town. I wish there were more of them here to endorse what I say on that particular subject. You find yourselves here holding a horticultural meeting amid the hills of the Hocking Valley, and in the southern section of the state of Ohio. We claim to be blessed by Providence with as wide a diversity of capacity as any other section of the state of Ohio. We not only have the great deposits of coal with which you are all familiar, but a very desirable agricultural country based largely upon the productive powers of the section to produce the ordinary agricultural products of the state of Ohio. Not only that, but this section of the state is peculiarly adapted to the production of fruit, and, therefore, it is fitting that horticulture should be the subject of your consideration. Horticulture, which embraces not only the production of fruits, but flowers and vegetables, all under the one generic term of *horticulture*, is a subject in which we are all interested, even those whose interests are but the æsthetic, in the production of flowers, rather than anything of a more substantial character. You have

met in a county which perhaps is unsurpassed, in proportion to the acreage planted, in the production of peaches. Our apple crop this year, you will learn, was very slim. I am told by those who are wiser than I am on the subject, that the cause of it was not frost, not anything untoward or inclement in the weather, but was the result of the overproduction of 1895. Here seems to be a case of overproduction, at the door of which we can lay one of our misfortunes. There is a good deal of dispute about the question of overproduction. But if it be true that the apple trees of a section refuse to bear apples only occasionally, periodically, and will not submit to being overtaxed, then it is a clear case of overproduction, and I know of no remedy for it. I commend to the distinguished members of this horticultural organization some sort of a remedy for this evil of overproduction. However, it happens that in the matter of peaches we had an abundance. I have nothing but the rumors that came to me on the streets, largely from the men who dealt in and handled the peach crop of this country, but I have heard the export of the county estimated—those peaches that were sent abroad in the sense that they were not consumed in the county—as ranging anywhere from \$150,000 to \$250,000, and that on the basis of a very low price, as a result of the uniform production of peaches throughout the whole peach growing section of the United States.

Now, I have only a word or two to say, and I say that from the standpoint of my own observation. The productions of horticulture—fruit and vegetables—are affected in their value by the general effect on farm products, of all the combined agencies that work and operate to depreciate or elevate prices. We are learning a great deal, but the American people never learn anything permanently and ultimately except by observation and experience. Theoretical knowledge is almost valueless in this country.

Now, one of the demonstrations of the past twenty-five years is the fact that farm products have been produced in too large a quantity, and the prices too low to make a remunerative return to the farmer. I want to speak about one single factor that has entered into this thing. At the close of the war we had about a million men in the North, and nearly that many in the South, who returned after four years as consumers—and they were very vigorous consumers, too. They consumed by the ordinary processes of consumption of farm products, and consumed also by fire and water, and by every other means by which consumption can be brought about; and the high prices of farm products at the end of the war, based upon the depreciated currency of that day, has always had a bad effect upon the judgment of the American farmer, because he always looks back to the time when prices were inflated and a market was everywhere ready for his surplus. Two million men returned to industrial life, and ceased to be consumers only, and became producers. They deployed, almost like a line of skirmishers, clear across the United States. If you will go into the more recently settled sections of Iowa and Nebraska, you will find towns of thousands of men of the war settled there, and upon the farm land of those great states. The result was overproduction. There was no market that was adequate, for the demand had fallen off on the one hand, and the supply had enormously increased on the other. About that time the policy of the government in the distribution of lands along the great transcontinental railroads brought into that country hundreds of thousands of farmers, who acquired lands along the railroads, settled homestead claims upon those lands, and bought cheap lands that had been given as subsidies to the railroad companies, and the enormous agricultural products crowded the markets. They went clear across the continent; they went down upon the Pacific coast and swarmed up the rich valleys of California. They colonized along the rivers of Oregon, and captured every available foot of land in what is now the state of Washington. This continued for fifteen or twenty years following the war, and the acreage of our farms was largely increasing out of ratio to the increase of the consuming population of the country. Our population was,

of course, increasing. It increased at a ratio above most of the European nations, but it did not keep pace with the ratio of production. Practically every foot of land in the United States that is available for farming purposes has been surrounded and captured by somebody. The opening of Oklahoma territory and the Cherokee strip has disposed of all the farm lands of the middle and southwest, while the tide of immigration which has swarmed across the continent to the lands of the great Pacific coast has taken possession of all the arable lands out there; so much so that the cry of the west and northwest is for the increase of agricultural land by the process of irrigation, and a great cry in congress to-day is the cry for the reclamation of the arid lands of the country.

A great many years ago I said, in an agricultural address, that no greater mistake could be made by the farmers of Ohio than to clamor for cheap railroad transportation. The whole cry, through the organization of farmers throughout the United States, was to reduce as low as possible the rates of railroad transportation. I said that nothing could be worse for the Ohio farmer, and that he was making a most egregious mistake when he insisted that distance should be destroyed. Compared with the freight rates at the close of the war, the average freight rates of the railroads to-day are less than twenty-five per cent. What has been the result of all this? While this swarm of agriculturists was moving westward, and seizing upon cheap lands, you were paying double that amount of taxes upon your lands. They were producing their products out there at that cheap rate, and you were clamoring that the wisdom of God be set aside, who located that land away off there, far from the centers of consumption, and that we should have cheap railroad rates. I lay at the door of cheap railroad rates more than fifty per cent. of the hard times that have come to the farmers of Ohio. We have got it now so that the farmers of Minnesota and Winnipeg, that inexhaustible country in the production of wheat, can put their wheat into New York for less than half what you could have put it into New York at the close of the war. What has been the effect? Why, we have abolished distance. The farmers of Winnipeg find themselves in competition with the farmers of Ohio, while the farmers of Ohio are paying taxes at a rate from five to eight times as high, and while their labor is vastly cheaper than your labor, they find themselves upon almost the same plane of railroad rates.

I want to put this fact before you. You are located here in the middle west, now the great center of population. Upon the east side are the swarming millions of men who are producing something beside agricultural products, and to whom you must look for a market; therefore, it is that you are interested in maintaining the difference in proximity between the manufacturing industries of New England and the cheap products of the cheap lands of Kansas and Nebraska. You are not interested that they shall put their wheat, corn, and cattle into the markets of Boston at a nominal cost.

Now, what is the best prospect ahead of the agriculturist to-day? It is that all this farming land has been occupied, and that population is growing, and the farm products are naturally reaching, so far as the great west and northwest are concerned, the high-tide of their value; that is to say, there are no more farm lands in the United States to be seized upon, and opened up to compete with the present farmers of the United States. That is practically the condition. I speak of the general result. The public lands are gone, whether wisely or unwisely, it is not a matter pertaining to this discussion. They are not to be the basis of future competition, and the best reason that I am right is the fact that the reflex wave of agricultural endeavor is being felt coming backward. Farms that were abandoned some years ago are being taken up again, and made to respond in a good profit. This teaches just this one idea, and that is, that the high tide of depreciation, if that is a proper term (it is a paradox), has been reached, and that the rising tide will be based upon two great propositions: First, the location of the agriculture; and second, the in-

crease of population and prosperity. The increase of population will go on. There are a few things we can rely upon. It will continue by several processes that never fail. One is the natural increase, and the other is by immigration into the country. The fact is, we have the *location*. Now, what is to be done? It seems to me that wisdom points out that the open door to the future prosperity of the farmer and horticulturist of this country is *improved methods of farming*. The great question to be solved by the farmer of to-day is: "How shall I make this land more profitable to me than it now is? By what process of farming shall I be able to produce more, and at less expense?" The development and improvement of farm machinery you all understand. I know something about the old machinery which I handled when I was a boy, and which I have never felt friendly to since. I know but little about the ratio between the cost of production then and now, but I know it is important.

That is all, gentlemen, I desire to say. I hope that wisdom will guide your counsel, and I hope that out of your meeting will grow a purpose to develop, not only scientifically, but effectually, the increase of the production of all this country is capable of, and a wise desire not to interfere with the geography of this country, which God made for your benefit. (Great applause.)

President Cushman: Ladies and gentleman: Of late years our State Society has become, or endeavored to become, a very practical organization, and it is somewhat of a surprise to me, at least as president, to listen to the address of welcome we have received here this morning, and I also have to say that our State Society, in choosing its president, has one in whom is lacking one necessary element, and that is the gift of eloquence, and our champion speaker not being present, we will have to defer any response to the address we have just listened to.

The usual method of conducting the exercises has been a short session in the morning, followed by the announcement of committees. I have not made out a list of committees this morning, from the fact that there are so few of our state members present. The matter can be just as well attended to at the afternoon session.

Mr. S. R. Moore: If it is not out of place, I would like to say to the people of Athens county who are here now, that I hope they will make an effort to have the young people join in with us in our sessions as much as possible, and also the practical horticulturists. I was here last fall and attended the fair, and I may say something that may call forth some remarks, and I would like especially for the exhibitors to be here.

President Cushman: There is one thing evident as we start out, and that is, that we are going to have an unusually interesting meeting.

On motion of Mr. William Miller, the Society took a recess until 1:30 o'clock P. M.

WEDNESDAY AFTERNOON SESSION.

Order was called by the President, at 1:30 o'clock promptly, when he announced that the first business in order was the announcement of Committees. The first announced was the Committee on Business, as follows: E. M. Woodard, William G. Storrs and William Bobo.

The next committee was upon "Exhibits," as follows: Theodore F. Longenecker, C. L. Whitney and William Miller.

The Committee on Membership was as follows: E. H. Brawley, Mrs. Lydia Stalder and A. L. Bethel.

The following persons were appointed upon the Committee on Final Resolutions: L. B. Pierce, J. L. Hine and Mrs. K. A. Arthur.

The President: The report of the *Ad Interim* Committee is the first thing in order on our program, and the first *Ad Interim* Committee-man is Mr. C. H. Waid, of Emery, Fulton county, Ohio.

AD INTERIM REPORT FOR DISTRICT NO. 1.

By C. H. WAID, of Fulton County.

Mr. President, Ladies and Gentlemen:

The summer of 1896 was one long to be remembered by the husbandman, for its adaptability to the growth of vegetation in every form.

An early spring, followed by a June and July with copious showers, made all hearts glad with the hope of a bountiful harvest. Ere the harvest time came the rains increased, resulting in much damage to wheat, oats and hay in shock. Strawberries bore a full crop, and brought a fair price for a fruitful year. A much less number of varieties are grown now than formerly, in fact, some growers have sifted down to two varieties for market purposes, viz., Crescent fertilized with Lovett. The latter variety is giving such universal satisfaction as a market berry that I am not sure but the time will come when the Crescent will be omitted. Bubach, Haverland and Greenville are grown by some, and seem to satisfy those who have a heavy soil, but are nearly failures on sand. Currants and gooseberries bore abundantly, and obliged our growers to hunt for a market more than ever before. Early cherries were quite plentiful, but when those who wait for bargains got ready to buy, they found that there were none in the market. The common sour cherries planted by our farthers are gone, or rapidly going. Of raspberries, the berry most grown in our section, the crop was simply immense. Consumers seemed apprised of the fact, and with the scarcity of money, and a full crop of peaches and apples in sight, prices ruled low at the opening, and lower as the season advanced. Hot, moist weather rendered frequent picking necessary and such hustling among growers to find a place for choice fruit was never before witnessed in our section. At close of season, when we figured our expense of picking, cost of crates, marketing, etc., we found that we had had about sixteen dollars of expense to one of profit. Of my picking, immediately preceding the 4th of July, I sent one hundred bushels to an evaporator, paid twenty cents per bushel for evaporating, sold in October for fourteen cents per pound, realizing an equivalent to ninety-nine cents per bushel for the fresh fruit. Of varieties, all did well this season, but I cannot pass without special reference to Eureka. Such clusters of large, rich, juicy berries I never saw on any other variety. A combination of an early Gregg with a large Palmer, with quality superior to either, gave

our grocers a chance to demand an extra price for Eureka of their retail trade. Blackberries bore well, but low prices could not be revived. Pears were so scarce that people ate Keiffers without a murmur. Plums were also scarce, and rotted badly on the trees. In my own experience, I omitted spraying before leaves opened, and found curculio hard to conquer afterward, so I am inclined to the belief that many adults are destroyed by early spraying. Peaches bore a fair crop of excellent fruit, which brought from one dollar to two dollars per bushel. A good word must be said for Elberta, which is beginning to bear with us, meeting all expectations. Another variety which did well, and is of excellent flavor, is the new prolific, from a Michigan nursery. Grapes hung on every vine, at least on every grape vine, in the country. A few were sold at a low price, and many were given away, where people could be found that would take the gift. Worden seemed to take the preference in our local market. Our apple crop was the greatest we have had in seven years. Several thousand barrels of choice winter apples were put on the market at from forty to fifty cents per barrel for the fruit. While superintending the packing of about fifteen hundred barrels, in perhaps thirty different orchards, I made the following observations: Such varieties as Greenings, Spies and Kings seemed to have had too long a season, and were prematurely ripe. Baldwin and Ben Davis were undersize, from overbearing, but have the appearance of keeping well. Apples grown on clay or loam showed better keeping qualities than those grown on sand. Fruit grown in orchards where hogs were allowed to run the greater portion of the year were much freer from worms than where not pastured. The Morris red continues to be a great favorite with consumers, where known. New strawberry plantations are looking promising. Old ones were overrun by weeds and grass in many places.

With a portion of my raspberry ground, I followed the advice of some of our horticultural writers, and did not cultivate after fruiting, trying thus to avoid stimulating a late growth of canes. At this writing I am ready to say, if I am forgiven for this one offense, I will never do so again.

Tree planting is still on the increase in our section, especially of peach and plum. One neighbor planted four thousand peach last spring; two others planted one thousand peach and one thousand plum each, and many others a less quantity.

The low price of fruit the past season has raised the question in many minds: Will not the business be overdone? When we notice the scarcity of money in the hands of the average consumer, and the extent of the fruit crop the past season, is it not rather a wonder that prices kept up as well as they did?

Fulton county increased somewhat in stature the past year by the completion of the Lima Northern Railway, thus opening a market to the north, and to the oil and coal fields of the south. When one of her sons is called to a place in the new cabinet, then will she indeed be proud, and the country's agricultural interests be ably guarded.

AD INTERIM REPORT FOR THE SECOND DISTRICT.

By E. M. BUECHLY.

Ladies and Gentlemen of the Ohio State Horticultural Society:

I am here to say that there has been nothing unusual to report for the Second District, located west central, which I have the honor to represent. The past season has been one that the horticulturist can look back over with some degree of pleasure, so far as productiveness is concerned. Some of you present may remember what we predicted in regard to the strawberry and blackberry crop, at our meeting

last winter; that we might expect a short crop. The weather, all through the strawberry season, was favorable to the very highest development of the luscious fruit, and, consequently, what fruit was set on the vines was brought to the largest size and highest quality, and the price through the season was very satisfactory, my crop averaging some over seven cents per quart. Among the leading varieties grown are the Bubach, Haverland and Greenville, of the pistillates; and Lovett, Cumberland and some others, of the staminate. The Greenville has behaved as well as usual. My experience the past season with the Cyclone has not been flattering. From the way it was recommended for trial at our meeting last season, I had hoped to find something better in it than we already had in the Lovett, but, if I may judge from this experience, I should say, save me from the Cyclone. I should say as much for the Marshall, for in two seasons' trial, it has shown but little fruit, and that very inferior. I think it is too fastidious in its taste for being petted by the amateur to be of value for the market grower. I have yet to see a staminate variety that yields as good a crop of fruit, and at the same time is as good a pollensizer as the Lovett. The growth of all strawberry plants has been remarkably strong, and I fear that most plantations are entirely too thickly matted with plants to do their best as to size and quality, and that, therefore, the crop of 1897, while promising abundantly as to quantity, will lack size and quality.

Raspberries of all kinds seemed to vie with each other as to which one could do the best; the greatest yield for years, but the prices were far from satisfactory to the growers; in fact lower than they were ever known to be. The same was true of all the fruits that followed during the season.

Eureka continues to do as well as the best of the black caps. Kansas has shown itself very well behaved. One very marked feature the past season, during which the leaf blight was unusually bad in its effect, and when the Gregg and most others were badly browned, the Kansas held its foliage in perfect condition. This is more than I am able to say for any other variety on my grounds. I had the pleasure to see the new berry, Munger, at its original home at Covington, Ohio, where I went to see it on July 4th. The plant resembles the Gregg very closely in general habits of growth and fruit; being fully as large or larger, somewhat less acid to most tastes, firm in texture and claimed to be some few days later than Gregg. It seems to be worthy of trial for a market berry where the firmness necessary for transportation is an object. I also visited the fruit farm of Mr. Kuth of Richmond, Indiana, during the fruiting season. He is growing the Eureka extensively, and has quite a plant of the new berry, Columbia, in fruiting. From my experience with this berry at my place and from what I saw of it there, I am inclined to think it has not been very much overpraised, and that it has come to stay. It is wonderfully productive, even on newly set plants, and a vigorous grower. There appears to be some doubt of the identity of this fruit that it might be only the Shaffer under a new name, but that it is a distinct variety there can be no doubt. While there is a close resemblance, it is more productive and its canes and spines are lighter in color. The Miller, red, shows itself to be quite productive and of fine color, and may prove of value for market, but its quality is hardly good enough for the home.

BLACKBERRIES.

Owing to the weakened condition of the canes during the drought of 1895 the crop was a very short one.

Gooseberries and currants were only a partial crop. Grapes were abundant with but little rot. Cherries were also quite plentiful, Early Richmond, Montmorenci and English Morello being the kinds mostly grown. Pears were probably a half crop, while apples were mostly distributed in parts of the country that lacked

a crop last year, and where they were overloaded last season they were almost an entire failure this year. From my observation in the orchards, I think the wood and fruit buds have gone into winter quarters in the very best condition, and with plenty of moisture in the soil to prevent or at least mitigate any damage that might arise from severe cold. I think there is promise in my section of good crops of tree fruits for 1897.

AD INTERIM REPORT FOR THE THIRD DISTRICT.

By F. G. WITHOFT.

The past season has not been a successful one in my district, either in the crop of fruit or in the prices. This has been especially the case in apples and pears. Of apples the crop was very light, and imperfect by the ravages of insects, more early and fall apples, than winter. The pear crop was better than that of apples, but prices very little higher. The wet weather of July and August rotted most of the plums, even such old and standard varieties as Lombard succumbing to the rot.

Native varieties of the Chickasaw type fared better as to rot, but worse as to market. Cherries were a good crop of the Morello class, and brought good prices. A large cherry orchard in our section this year would have been a bonanza. Best sorts Montmorenci, Dye House and Early Richmond. For the first in our section for several years, there were a good many peaches, and here the hardiness of some of the new and lauded sorts came to their testing, as there were bud-killing freezes in February and bloom-killing frosts in April. In this test the so-called ironclad *Crosby* came through safely, bearing a full crop of rather above medium sized fruit, yellow fleshed, freestone, and of good flavor. The fruit lacks a little in color to make it most attractive, yet its hardiness, heavy bearing and good flavor give it a high rank as a paying orchard sort. Ripened, August 15.

ELBERTA has taken a place in the very front rank, hardy in bud and tree, of large size, and fine appearance, yellow fleshed, freestone, and a fine shipper. September 1.

CHAMPION, early, large, white flesh, freestone, not very handsome—lacks color—moderately hardy, of fair flavor, and is worthy of trial planting.

DEANS RED FREE, originated with Dean Brothers of Southern Indiana, is a large finely colored, white flesh, freestone peach that comes in the season of old Mixon Free, and having all the good qualities of that old standard sort, and none of its dull green color, is very desirable.

The DIAMOND, which originated in Athens Co., O., bore a full crop in our section for the first this year, thereby proving its claim to something above the common varieties in hardiness. Of this peach the Horticultural Press of a neighboring state says this year: "The finest yellow clingstone peach in existence, and though classed as a cling, yet it clings so moderately that by cutting around it in the center from stem to apex, it is readily separated from the stone into two clean cut halves, making the finest canner now known. Its color is of the very purest golden, covered with spots and splotches of deep dark red, coloring up highly even ten days before ripening. Its size is above that of nearly all other known sorts, its flavor of the finest, and its bearing quality among the best. At the Ohio State Fair this year the dozen or more plates of this variety, exhibited from different parts of the state, attracted universal attention.

In raspberries, the new black Cap Eureka has grown in favor among all our planters, as taking the place of many inferior black caps. Ohmer blackberry holds its own as a large, showy and highly flavored sort. We of the Miami Valley are not discouraged in fruit growing, so long as we get fruit of some kind every year to mix with our abundance of "hog and hominy."

AD INTERIM REPORT FOR THE FOURTH DISTRICT.

By WILLIAM MILLER, Gypsum, Ottawa County.

An abundant apple crop, 20 per cent. of a peach crop, 10 per cent. of a plum crop and 25 per cent. of a crop of pears, is about the record for the tree fruits of Ottawa county for 1896. Small fruits plentiful, but with the exception of grapes are little grown for market. Our great staple, the peach, out of which our money is coined, started out in spring with abundant promise. As the political-campaign advanced, about sixteen peaches dropped off to where one remained on the tree. The so-called "June drop," like all other products, came in advance of its usual season, and by the 20th of May had greatly shortened crop prospects. The crop was largely a question of varieties, ranging from a total failure with some to a full crop with other varieties. Those of the Crawford variety and type produced very little fruit. The Hills Chili, Elberta and some others produced full crops.

In former reports we have stated that the Elberta was the best all-around peach yet introduced. The experience of another year adds emphasis to that report. Its phenomenal success wherever fruited has caused great demand for trees of that variety, more than northern nurserymen are able to supply. Its quality suggests the query, whether we may not look for greater improvements in the way of varieties from peaches of Chinese ancestry than from our old standard varieties.

Plums brought scanty returns for the labor of the cultivator. That arch enemy of the plum grower, the little Turk, like other crops, ripened early. Such short time passed between the breaking up of winter and the bursting forth of vegetation in the spring, that orchardists were not prepared for the appearance of the pest, and delayed preventive measures until much damage was done, and in many cases the entire crop destroyed. We have learned that to successfully fight curculio with poisonous applications, we must coat the first appearing leaves, so that at its first dinner the young insect may have Paris green for dessert. The few who were ready for the first appearance of the pest had a good setting of plums. As the season advanced, another and greater enemy appeared. The abundant rains and moist weather were favorable to the development of rot. In some cases as high as 90 per cent. of the fruit was destroyed. The many who are expecting fortunes from this fruit will find this the most formidable enemy they will have to fight. Let us hope that the efforts now being made to control it may be successful.

Of insects and diseases the year produced an abundance. Slugs did great damage to pear and cherry trees. The trees were, in many instances, so denuded of their foliage, that no fruit can be expected next year. Why an enemy so easily destroyed is allowed to do so much damage is not easy to explain.

The foliage of plum trees, where not sprayed, was badly injured by shot-hole fungus. Apple scab was less prevalent than usual. Black spot, or scab, was very abundant upon many varieties of peaches, especially so upon the Hills Chili and Salway. Many of the latter were cracked open. A fair estimate of the damage to this variety would place it at not less than 10 per cent. of the total crop.

We regret to say that the yellows have made their appearance in several orchards. Some of our orchardists have been harboring the belief that our territory would not be invaded by this dread enemy of the peach grower. Its appearance has shattered the faith of those who believed that trees grown on a limestone clay would not be subject to this disease. But the growers are on the alert, and will not let it get a foothold if thorough enforcement of the law will prevent. The yellows commissioners have found the owners of orchards always ready to cooperate in the search for diseased trees, and ready to destroy any suspicious cases. As one grower puts it, "If we can only keep orchardists scared about the yellows, we need not fear the disease." Not more than a dozen trees have as yet been found.

The fruit bark beetle has become more abundant than ever before. Many were at first inclined to take exceptions to Professor Webster's statement that this insect would not attack a healthy tree, but more careful observance of its habits have convinced them that he is never found unless the tree attacked had in some way been weakened. If he will only detect a tree attacked by the yellows his presence will not be an unmixed evil.

Our orchards are in good order, have made splendid growth, and are in good trim for the good crops and good times coming. Growers congratulate themselves that if our trees must occasionally take a rest, it is better to have them do it when other people have plenty and prices are low.

REPORT OF THE FIFTH DISTRICT.

By W. N. SCARFF.

The up-to-date horticulturist has no time to cry over spilled milk, so we turn our backs on low prices and the many other difficulties that overtook us this season, and look forward to better times, better prices and prosperity, remembering the past only to that degree that we profit by its experience that we do not make the same mistake the second time.

THE OUTLOOK FOR 1897.

Never in our experience have we had such a growth of strawberry plants.

Many varieties have completely covered the ground, making a continuous bed even where rows were set four feet apart. Certainly they are too thick to produce fruit of marketable size. Thinning is out of the question. The expense would overbalance the profit. Even such kinds as Wilson and Parker Earle, which with the best of care do not as a rule, make plants sufficient to make a decent row, have made rows equal to a Crescent in an ordinary season. If our market is not glutted next year with small berries, it will be because Jack Frost has made us a visit in the meantime and destroyed 95 per cent. of the bloom.

This year Jessie, Sharpless, Eureka, and other older kinds did remarkable well, in fact were among our very best, which will cause many to again plant heavily of them, and will fail to obtain a crop about four times out of five. Such are the times. We want to refer to the past and note the many failures to a single success, and then fix our hold more firmly on the never failing varieties which produce a crop, rain or no rain, hot or cold, and of which we have as good reason to expect remunerative returns as we have from a crop of corn or potatoes. In this class we may safely place Haverland, Warfield, Crescent, Bederwood, Greenville, and we have reason to believe Brandywine and Staples.

For the good of practical horticulturists too many newer kinds have slipped into our lists that have no special merit, or at least are no better than varieties we already have. Unless a new variety has some superior qualities it should not be introduced. The above mentioned kinds possess all the good qualities of our entire list of perhaps one hundred kinds. We notice rust is rather more prevalent than usual on the strawberry, attacking Bederwood, Michels' Early, Marshall, Wilson, Manchester and Enhance, worse than other kinds.

The condition of grapes, red raspberries and blackberries is good, and promise a good yield the coming season. Blackcap raspberries have not done well, and we cannot expect more than one-half a crop at best. They also failed to produce a full crop of plants. Those tipped early, when the ground was wet, are a complete failure, while those tipped as late as the middle of September did much better.

Such kinds as Souhegan, Johnson, Hilborn and Shaffer are almost a total failure. Currants and gooseberries dropped their leaves soon after fruiting in June, and remained bare through the season, leaving the fruit buds exposed to the direct rays of the sun, which will, no doubt, injure them and make a light crop of fruit. Berry fields in general are not in as good condition as usual. It has been a hard fight against the weeds, with so much rainy weather. It has been as clearly demonstrated that mulching is as valuable in a wet season as a dry one, although it serves a different purpose. Where our currants, gooseberries and blackberries were heavily mulched they are comparatively free from weeds, while those not mulched were almost impossible to keep free from weeds, the difference in the cost of labor being more than sufficient to cover cost of mulching material. In a dry season, it not only prevents the growth of weeds, but conserves the moisture in the soil, making it possible to mature a crop in the severest drouth. If the benefits of a mulch were better understood, it would be used much more extensively. To me this is the practical irrigating plant for the small fruit grower. By covering the soil with some cheap material we can hold in it as much water as we could pump with a ten horsepower engine, and distribute with the most complete system of gaspipe and rubber hose.

I see no use why practical horticulturists need bother themselves studying plans for an irrigating plant. It is all good theory, and a nice story for our writers to spin to the public, always works well on paper, but in practice, not once in a hundred times. We have too much theory in horticulture that will not hold out. As a rule, we are horticulturists for the dollars there are in it, and the sooner we learn to discriminate between plain, cold facts and the fairy tales of some one's flowery imagination, the less disappointments we will have to encounter. We *must* understand that our soil here is not so fertile that we can grow one thousand bushels of blackberries per acre, as they do in Wisconsin; also that twelve hundred bushels of strawberries per acre can only be grown by originators of new varieties; that there are millions of trees just as good, just as fresh and just as cheap as any of the fresh dug Danville trees, and lastly, that Michigan and Connecticut are not the only states that produce pedigree plants.

REPORT FOR SIXTH DISTRICT.

By NELSON COX.

The season of 1896 has been one of varied circumstances. The apple orchards bloomed full and gave promise of a good crop of apples, but when the bloom went off all was gone. There was not apples enough in this part of the state for home use; not any for the neighbors. And the enormous crop of 1895 with the dry summer killed nearly all the old apple orchards, so there is not more than three-fourths as many acres of apple orchards as two years ago. The strawberry crop was a reasonably good one, although the old reliable Crescent, on sandy land did not come up to its former standing. The berries were rather small and knotty; had to be sold at a small price, while Sharpless, Haverland, with others of the larger type, gave large crops of very fine berries, and one crop of Haverland averaged eight cents per quart for the crop. The strawberry plants for the crop of 1897, as a general thing over the country, do not look promising. The wet summer caused such a crop of grass and weeds to grow among the plants, that it was a great injury to them, and some plants look scalded, and have not made vigorous growth. I have about four acres of Sharpless, Haverland, Barton and Hoffman in new land, north-east exposure, that look very fine, and is the admiration of everyone that sees them.

They are on steep ground, and have been tended with hoe and not a weed allowed to grow. Of blackberries, I am cultivating Snyder, Erie and Early Harvest. All done well and sold for reasonable good prices. But the Snyder is in new, rich land, and I fear that I cannot keep it in bounds. There are not very many raspberries grown about here. What is, does very well, and finds a good market. Peaches on the hills were a good crop. Orchards from four to eight years old were very full. My own was so full that we thinned them severely, as it looked at the time, and as the peaches began to ripen we commenced picking the ripest and selling, and we soon found we had not thinned enough at the start, so by picking the ripest every other day, we extended the picking season for ten to fifteen days for each variety, and all the peaches grew large and good color. Our local markets took all our peaches at good prices. The plum crop was very small. The cherry crop was light.

AD INTERIM REPORT FOR SEVENTH DISTRICT.

By E. M. WOODARD, Lake County.

Last year when the Ad Interim reports were given, the society was reminded of the fact three or four times that "All is not gold that glitters," and we might add neither is all silver that shines.

We have been told repeatedly within the last few months that the way to solve certain problems was by ratio—sixteen to one. This seems to have been about the proportion during the past season; *sixteen* representing the drenching elements,—hard times, low prices and general depression, and *one* the success of the farmer and fruit grower.

The spring of 1896 was very dry, and we feared a repetition of the drouth of 1895, but about the middle of June it commenced to rain, and from that time until the first of November it was "rain in front of us, rain behind us, rain to the right of us, rain to the left of us, volleyed and thundered," as a result vineyards, berry plantations, and cultivated fields generally were covered with a luxuriant growth of vegetation not especially desirable. Frequent heavy rains continued until about the first of November.

Last spring nearly all varieties of fruit blossomed very full. The weather was dry and warm, permitting of perfect fertilization, with the exception, perhaps, of the strawberry. Many of these were small and imperfectly formed, with a hard core on one side.

Reports from Lake, Lorain and Ashtabula counties place the average price at six cents per quart. The varieties mostly planted are Crescent, Bubach and Warfield.

The raspberry crop was fully equal to 100 per cent. in yield and quality. One of my neighbors said that at the first of the season his pickers used the single berries of Greggs for umbrellas to keep off the sun and rain. Palmer and Souhegan are the leading sorts for early. The Eureka is gaining in favor. I had a few that bore for the first time. The berries were beauties for size, and the quality superior to any of the varieties mentioned. Its greatest fault seems to be in not giving quite enough canes for the next year's fruiting.

Taylor and Snyder are the favorites in blackberries, that is, if there are any favorites at all after the past season's experience.

The hot weather and frequent rains made the berries very soft. Sometimes juice was running from the stands before they could be put upon the Cleveland market.

Victoria is the best red currant for commercial purposes. For several seasons, currants have brought better prices than other fruit, and planting is rather on the

increase. The crop was above the average and prices ruled low. The bushes were affected with mildew somewhat, causing the leaves to drop early.

Last year plum trees bore heavily. As a consequence, the crop was light this season. A good many young orchards have been set recently, and in a few years, if nothing prevents, the yield will be more than doubled. People are waking up to the necessity of fighting the black knot in time, largely through the influence of local horticultural societies.

There were practically no peaches of the budded varieties in the four counties of the Seventh District which border upon the lake, and but few of the natural kinds. Further south the crop was better, but not an average one.

Disease is affecting the older trees, and the future supply of fruit will mainly come from young orchards. However, the rate of planting has been greater than in former years, and growers are hoping for fuller returns another season. It seems to me that the buds are larger now than they should be to withstand a hard winter.

A year ago pear trees blighted very badly. Some orchards were entirely destroyed. This year the trees have not been so badly affected, still many have died. Of course, the Bartlett is still the leading variety planted, but the Keiffer is slowly forging its way to the front. Its hardiness, rank growth, early bearing habits, and fine appearance of fruit when well ripened, make it a favorite with planters.

The apple crop! Well, it was simply immense. Last spring I drove about twenty miles south from our place, and not for years had there been such a wealth of blossoms. The promise of a bountiful harvest was not simply a promise, either, but was fulfilled in the largest crop that we have had for years. Every old tree and part of a tree wanted to do its best towards making up for neglected opportunities. Many tried to do too much and broke down beneath the burden.

As a rule the fruit was perfect, not because of spraying, but because the season was unfavorable for insects.

Prices have been about 50 cts. per bbl. for picked fruit of the choicest varieties. There has been but little demand for cider apples. Some were stored for feeding, but more were left on the ground to rot.

Time would fail me to tell of the trials of the grape-grower the past season. Baskets cost four to six dollars per *M* more than last year, picking as much as if grapes brought 25 cts. or more per basket and the price obtained about one-half of last year.

The output of northern Ohio was one-third larger than any previous year, aggregating about 2,000 cars of 24,000 lbs. each. Some young vineyards bore for the first time, others are still coming. The old ones have made a good growth of wood for next year's fruiting. If everything is favorable, next season's crop will be still larger. The low prices have retarded new planting and the increase of acreage will not be as rapid as in the past. The Concord is still the leading variety, but its shipping qualities were very poor.

The wet season induced a rapid growth and early maturing of the fruit. The skins were very tender, filled with a large amount of *water* instead of *sugar*. Wine-makers tell us that the price is 20 per cent. below the average. As a consequence, much of the fruit reached distant markets in poor condition and brought very low prices. This condition of things was not confined to northern Ohio, alone. New York shippers had the same trouble. Wordens behaved still worse. They ripened very unevenly, and at once commenced to crack. Some were left on the vines unpicked. The only way to secure them at all was to pick each cluster as soon as ripe. We went over our vineyard of 1,000 vines six times. There was but little spraying done in vineyards, and but little rot was found.

Delaware vines mildewed quite badly and shed their leaves early. As a consequence, the fruit ripened poorly. In my own vineyard I sprayed the Delawares three times, trimmed closely and thinned the fruit after setting. The leaves re-

mained on until after the fruit was picked and all the clusters were fine and well ripened.

Of the less known varieties, the Lindley (Rog. No. 9) is the best of Roger's Hybrids for table use. Goethe (No. 1) is a beautiful grape, but is later than the Catawba and can only be grown where this variety can be well ripened. Green Mountain is a fine white early table grape. A strong grower produces a full crop of fine bunches. The habit of vine and quality of fruit is in every way superior to the Lady. Eaton, a seedling of the Concord, is a large showy grape, but not as prolific as its parent. Prentiss and Jefferson are not a success if given ordinary vineyard cultivation.

Horticulturists, as a rule are a happy and hopeful people, and if they fail the first time, try again.

KEEP A-GOIN'.

If you strike a thorn or rose,
 Keep a-goin'!
 If it hails or if it snows,
 Keep a-goin'!
 Tain't no use to sit and whine
 When the fish ain't on your line;
 Bait your hook an' keep on tryin'—
 Keep agoin'!

When the weather kills your crop,
 Keep a-goin'!
 When you tumble from the top,
 Keep a-goin'!
 S'pose you're out o' every dime?
 Gettin' broke ain't any crime;
 Tell the world you're feelin' prime;
 Keep a-goin'!

When it looks like all is up,
 Keep a-goin'!
 Drain the sweetness from the cup,
 Keep a-goin'!
 See the wild birds on the wing!
 Hear the bells that sweetly ring!
 When you feel like singin'—sing!
 Keep a-going'!

AD INTERIM REPORT FOR EIGHTH DISTRICT.

By H. H. AULFATHER.

From the time of the last meeting until the 11th of April the weather was favorable for the preservation of the fruit buds, the mercury hovering near the twenty mark, seldom rising above the freezing point or dropping as low as ten degrees above zero, the greatest variation of the temperature being that of the 11th and 12th of April, when it suddenly changed from winter to summer weather, the mercury registering at eighty four degrees above zero at noon on the 12th, a change of

fifty-six degrees in about twenty-four hours. The warm air and bright sunshine, with frequent showers, caused the buds to burst forth into leaf and bloom, and in a remarkably short time the trees, vines and plants had set their fruits; and by the 10th of May the season was far in advance of that for many years. By the 20th of May all fears of frost were dispelled, the spring planting had made a rapid growth, and through the district the prospect of the most bounteous crop of almost all kinds of fruits was assured.

Because of the short harvest of the previous year, the plants had been well cultivated and were in good condition to yield well. That, with the great demand for the early strawberries, and the good prices received for them, and the large supply of empty jars in the cellars, made many a grower smile to think that his once fat pocketbook, that had been so scantily filled in the past year, now would have its sides puffed out farther than ever before. But as "the race is not always to the swift," so it has been with the growers the past season. Often those with large crops who were compelled to furnish packages, pay express charges and commission, received less than the grower with a small plantation near the same market, but who could avoid such expenses, and to many the season of 1895, with its frosts and drouths proved to be the most profitable of the two.

All varieties of fruit ripened about twenty days earlier than in other seasons. The growers in the southern part of the state sent their surplus crops to our markets to find them already supplied with the same fruits by the home growers. The time of ripening seemed to be the same all over the state. The city markets were receiving the same kinds of fruit from all directions at the same time. This, and the poor condition in which the raspberries and blackberries were sent to market caused the greatest glut of these fruits ever in our city markets. Much of it probably would have been averted if the fruit in the different sections had ripened at their usual time.

The plantation of strawberries was large, and on both high and low lands they produced fine crops of large berries which sold readily at from eight to fifteen cents per quart, the small varieties and culls finding slow sale at from three to six cents per quart.

In some localities many new plantations failed to produce full crops. The wet weather in June caused the berries to be soft, and some varieties rotted badly. Considering the large yield, and the scarcity of money among the people, the strawberry was the best paying crop in 1896. Many of the newer varieties have been tested for the first time, and none have given promise of yielding larger crops, or berries, than the Bubach, Greenville, Haverland, Barton's Eclipse, Lovett, Tennessee Prolific, Saunders and Gandy, all of which produced large crops of mammoth berries. Of the newer varieties tested, the Bissell for large crops, the Brandywine for large, and Princeton Chief for late berries, were the most promising.

For the last five years I have been testing a seedling of my own, planted alongside of some of the newer varieties sent out each season, and have found nothing that yields better or produces as many large, fine colored berries.

The early raspberries yielded a heavy crop, and brought the best prices, ranging from \$1.25 to \$3.00 per bushel. The Eureka and Palmer are the favorites. On my own grounds a crop of sixty-six and one-half bushels of Palmers were gathered from thirteen rows, twelve rods long, and it was estimated that fully fifteen bushels were left ungathered, on account of the very low prices. The Gregg raspberry and the Snyder blackberries yielded the largest crop of these fruits ever gathered, and prices were the lowest, ranging from fifty cents to \$1.25 per bushel. The Erie and Lawton's BB were fine, and sold for \$1.40 to \$2.00 per crate.

The market was well supplied with red raspberries and prices here ruled lower than for several years.

Currants and Gooseberries did well where planted, especially the Fay currant, which produced a fine crop and sold high. There is not enough currants grown in the district to supply the home demand.

There was nothing new in the line of cherries. The crop was heavy and quite free of worms, and with prices at from five to ten cents. The demand was not supplied.

Plums produced abundantly of the newer varieties. The Burbank yielded some fine fruit. Fully one-half of the Lombards and all of many other varieties rotted. The little Blue Damson gave the best satisfaction. Prices varied from fifty cents to \$1.50 per bushel. My attention was called to a seedling called the prune plum, that has been bearing for several years. The tree is a thrifty grower, of the spreading habit. The fruit is somewhat smaller than the German prune. It is of a bronze color, turning almost black when it is ripe. The people seem to think it a better plum than the Damson, but I think it inferior to that variety, and in shipping it did not bring as much as the Damson.

Peaches were abundant wherever trees were healthy and old enough to bear. The choice budded fruit was in demand at from 50 cents to \$1.50 per bushel, while the common seedling did not pay to gather, and many were allowed to rot on the ground. The Lemon Free, Elberta and Smock seem to be the best varieties. The Crosby is well spoken of in Ashland county.

Grapes and quinces were a drug on the market. Quinces spotted badly. Prices varied from 15 to 50 cents per bushel, and grapes were dull sale at from 40 to 50 cents per hundred pounds.

For several seasons our apple crop has been a local one, but this year it was a general crop on both old and young trees, except where they bore a crop in '95. The fruit was almost perfect in appearance, generally large, high colored and of fine quality. Prices have ruled low, 30 to 40 cents per 100 pounds for choice hand-picked apples, while wind-falls and cider apples were from 10 to 20 cents. Many seedlings have borne their first crop. Some, I think, are worthy of propagating, but it will require another crop before venturing far. Of the newer varieties the Yellow Transparent and Wealthy were very fine and will be planted largely. The Red Bietigheimer and Stump made a fine show, but that seems to be their chief merit. The Ohio Nonpareil has made another great record. The trees bore a heavy crop of very large, high-colored fruit, and the prices and demand were greater than for any other apple. Columbiana county fruit growers may be proud that their county is the place of its origin. It should have a place in every orchard. The Baldwin still heads the list as a market variety, but for home use and near-by markets the Grimes' Golden is a better apple and takes its place. The Ben Davis were large, fine and high colored. The Flushing Spitzenburgh were fine, and the trees held up their heavy loads with the least damage by breaking.

Many orchards were sprayed for the destruction of the curculio and codling moth. The former was very abundant early in the season, but no perceptible difference could be observed between the crops gathered from sprayed and unsprayed orchards. The largest and finest colored fruit was mostly gathered from the orchards located on the hill lands. Those grown in the valleys were generally off color and covered with a mould and had a mildewed appearance, which injured the sale of them, although the reverse seemed to be the rule in Ashland county; their finest fruit was gathered from the lowlands.

The season has been favorable for the production of wood, and fruit buds and plants have gone into winter quarters in fine shape, and notwithstanding the large crops of tree fruits the chances are favorable for a fair crop in 1897.

The display of fruits at the county fairs was large and fine, but of those I visited, that of Summit county was the most elaborate of any, they showing the finest display of grapes I have ever witnessed at a county fair in this section of the state.

The horticultural societies in the district are in good standing and hold regular monthly meetings. Some of them have taken up the work of enforcing the black knot law, with good results. I believe that we can do more effective work in enforcing the black knot and yellows law through the aid of our County Horticultural Societies than in any other way, by having them appoint committees in each township in the county to see that the law is enforced in their respective townships, and have them make monthly reports to the Society of what they have done.

There have been no new Societies organized in the district the past year, but an effort should be made to organize a good live Society in each county in 1897 for the purpose of enforcing the black knot and yellows law.

AD INTERIM REPORT FOR NINTH DISTRICT.

By S. R. MOORE, Zanesville, O.

Mr. President, Ladies and Gentlemen of the Ohio Horticultural Society:

Since our meeting at Dayton last February, we have had an abundance of almost all kinds of fruits, flowers and vegetables, as well as an abundance of rainfall; also an abundance of weeds, which in some places almost absorb what the crops should have had in the way of fertility, especially on the low lands, which last season was more suitable for crops than the season of 1896. Wheat was least productive of all others, all things considered. Pastures and lawns never looked so green at this season as they do to-day, December 2d. Berries of all kinds are in most elegant condition for bearing heavy crops the coming season of 1897. The past season, where the peaches were fairly treated, yielded an abundance of as fine fruit as ever was sent to market. Our local market was at all times stocked, and hundreds of bushels were shipped to Cleveland, Youngstown, Pittsburg and other markets, where growers said they received better prices. Mr. Kearns, one of our best and most successful growers, gathered, in the height of the season, nearly 100 bushels of strawberries per day for several days, most of which was sent to other markets. Another grower with about four or five acres told me he realized over \$1,000; and \$700 of it was clear gain to loan to some less fortunate neighbor. The strawberry is his special crop; but he grows other garden crops, such as several acres of tomatoes for canning house, etc. And, not being a boastful man, but rather reserved, I drew from his conversation that his small farm of some seventy acres was making handsome returns over and above a living, far better than others with broad acres, where quantity of land is the principal of its owner with old time methods of corn, wheat, etc.

I make this statement, not to induce every owner of land to follow in the same line, as soil, market and facilities for operations are not all alike; but many of them could be made better by a little study and a few trial experiments with but little outlay. "Prompt action and thought" must be the motto to attain success. Delays of a day or two in berry culture, especially in strawberries, means a failure. Planting, cultivating, picking at the exact time, together with fertility and a good home market, are the essential qualities to be sought for. Each season appears to add more acreage, which means more berries, and we hope for more prosperity, that all classes may have remunerative wages, constant employment, and enable them to purchase every luxury produced upon the farm, whether it be berries, peaches, pears or meat.

But few gooseberries and currants are grown. Our market has not been so much depressed by a superabundance of either, and it might bear a few more producers of the best kinds, if someone would undertake it. Perhaps this would only apply to our own town.

Cherries, when in bloom, were promising as anything I ever saw; but for some unaccountable cause, after the fruit formed, they nearly all dropped from the trees, with some few exceptions; but what ripened were nice and free from knots and other defects. No frost occurred to attach the blame to, as has often been the case.

The quince crop was quite good, notwithstanding the blight, and sold at our market from 40 to 80 cents per bushel.

Plums bid fair until almost matured, or about the time of coloring, when they began to rot; and under the trees was only a mass of decayed fruit. One beautiful Lombard tree near my house was laden, and when they commenced rotting I made an effort to shake down the rotting ones, and gathered them up off the ground thinking every day the rot would cease. It was all to no good; only a few dozen ripened, while I think a safe estimate of the loss by rot was four to five bushels from this one tree. A few on the Murdy, the first to bear its fruit, rotted just the same. The same is true of nearly all others.

Pears were not a large crop with most growers, but enough to supply the home market, at prices of 60 to 80 cents per bushel according to kinds. A pair of Bartlett trees on our ground, which last season blighted considerable and produced a fair crop of fruit, was trimmed, and all the affected branches removed at the time the fruit was gathered; and this year they were almost free from any blight, and better and larger Bartletts never grew anywhere in this section of Ohio than the crop of this season (1896) and they now bid fair to live a number of years. Others, and some other kinds, were treated in like manner with reasonably good results, especially the Keiffer.

Peaches! This was of all crops immense. Peaches everywhere. Old trees loaded and broken, young ones, seedlings, in by places, everywhere, some excellent, others not so good. On almost every farm could be found some seedling good enough to be propagated. As our list is getting so great, unless of some special merit, it would seem as though we had enough varieties that are profitable. In fact, some of them that have but little merit in Ohio should be stricken from the list. The experienced orchardist knows what is the best for him to plant, but the new beginner is generally the one to suffer loss of time, money, etc.

I had the pleasure of examining the peaches here at the Athens County Fair. Among the excellent varieties, some of which to me were new, I wish to say, the growers, who were exhibitors, were certainly no novices in peach growing. However, some of them may have learned by actual experience that some varieties planted and recommended were not well adapted to their locality. As we are here among them they can speak for themselves.

Their apples, some very good ones, were badly misnamed; not much more so than other counties where Horticultural Societies have not yet been organized. Our apple crop throughout the country was not so large as last season. The fruit was larger and quite free from worms or scab. Prices in our market at this time 35 to 50 cents per bushel in a small way; less by the barrel.

Cider was abundant, from the fact apples were ready to gather about the second week in September, or about the 10th day, almost or quite a month in advance of other seasons. A wind storm at that season reduced the picked apples to one-half of what it should have been. Our Jonathans and Fameuse should have been gathered not later than the 12th of September, but a few days delay and the greater part, at least three-fourths of them, were on the ground. Sold as drops or made into cider, and most excellent cider, too, they made. However, trees that bore heavily last season, and in certain localities, had nothing or scarcely any on this season.

Nut bearing trees in their wild and uncultivated state. We have an abundance of walnuts and shellbark hickory. Chestnuts failed for some unknown cause. The trees were full of tassels, but failed to set nuts. Whether rains at that season may have destroyed the pollen I am unable to say exactly.

Trees and plants of all kinds ripened up in excellent condition and bid fair for enormous crops in 1897.

The fall has been the most favorable for planting orchards, shade trees, shrubbery and outdoor bulbs of any that I can remember in my experience of thirty years. The weather was not cold or raw; the ground was neither dry nor wet, but as near perfect as could well be. Some planters made good use of the opportunities, while others are yet waiting to see.

The Ohio weed law as amended does not appear plain enough for the average man. We, as a County Horticultural Society, made an effort to enforce it. I sent two or three communications to the council; the same to the Mayor and Street Commissioners; had an interview with the City Solicitor, and all found some flaw or excuse for dodging the law, and in fact regretted such a law existed,—plead ignorance, and offered all manner of excuses to evade the enforcement, and the most dangerous weeds, like the prickly lettuce, ox-eyed daisies and Canada thistles are on the increase, and bid defiance to laws, and officers whose duty it is to enforce them. About our own place we do not allow them to exist, but others nearby and on the streets, alleys and byways do. The prickly lettuce is flourishing as though it were intended to be. It may be a useful plant; as yet I am not aware of what it is used for.

Insects did but little harm, and spraying, so far as I know, was but little practiced.

Some few grapes are grown in a small way, and sold by marketers early in the season before fully ripe, at 3 to 5 cents per pound in very small quantities. When the grapes come in from the Northern Ohio growers, and are sold by dealers at two baskets of nine or ten pounds for 25 cents, it is useless for our people to undertake competition. I hardly see how the grower can realize anything after the commission men, railroads and retailers get a profit.

As an organizer of Horticultural Societies in my District (the ninth), I confess that what efforts I made, nothing came from them. Here in this county (Athens), a society has been organized, but no part of it can be credited to any effort on my part. Prof. Green may have had a hand in its organization. The peach growers may have caused it for mutual benefit. I am glad to see such an organization springing up among the people of Athens County.

Here, under the shadow of such a fine educational institution as the College, with young men and young ladies of more than average intelligence, instructors without their peers, is a golden opportunity for a society, second to none other in the state of Ohio or any other state. The farmers' institutes are the best opportunities for young people, as practical men of large experience are paid by the state, and no class needs assistance more than the tillers of the soil. The past few years have brought about changes that in the end may be a lesson of great good. A very large number of our leading and public men sprang up from the farms—some of them from Athens county, Perry and Muskingum. Go where you will in any county in Ohio, and look up its history of great statesmen, great generals, and you will find Garfields, Sheridans, Shermans, Hayes; and there is no other state in the Union to compare with Ohio for its endless resources. Clays of all kinds underlie the hills; coal, ore, peaches and pastures on the hills, on the level lands, corn, wheat, and meadows abound. Along the lakes, grapes, peaches, plums, fruits of all kinds in abundance.

Take courage, young men, and let knowledge and industry abound. Be industrious, and those who are the young men of to-day, will be the coming men twenty-five years hence, either as Horticulturists, farmers, statesmen or professional men.

At the last moment I gathered a few statistics as follows:

Along the line of the B. & O. R. R., between St. Clairsville and Concord in the eastern part of Muskingum county, 46,000 bushels of strawberries and raspberries were handled by the express company, the principal markets being Pittsburg and Chicago. Barnesville alone shipped 22,000 bushels.

The peach crop in northwestern Muskingum county in an area of two townships, Licking and Hopewell, has been put at a safe estimate of something over 100,000 bushels. Other townships in the northern part of Muskingum and the southern part of Coshocton furnished quite as many more.

AD INTERIM REPORT FOR THE TENTH DISTRICT.

By FRANK FORD, Ravenna, O.

The past season has been one to be long remembered as the most fruitful for many years. All varieties of fruits were abundant, and of fine quality. The apple crop in this part of the state was simply enormous, but owing to a general crop throughout the country and excessive freight charges, prices have been very low. Large quantities of apples were shaken from the trees and picked up with the wind-falls, and sold for 15 cents per one hundred pounds, delivered at the cars. Hand-picked apples were sold for 30 cents per one hundred pounds. We loaded a car mostly of our own growing at 40 cents per hundred pounds late in the season. Quite a quantity had rotted. This, with extra expense of resorting, left us no more than those got who sold for 30 cents. At these low prices it would have been just as well if there had been only enough for home use. Thousands upon thousands of bushels of apples were never gathered. Owing to the fact that there were no apples last year for the Codlin moth to breed in, there were but very few to prey upon the apples until the second brood. Although not numerous, they seemed to put in full time.

Pear trees that had any live wood left after the severe cold of 1894-95 and the frosts of the following May (causing what many are pleased to call blight) were full of large, smooth pears.

Peaches were only an ordinary crop, owing to a large crop the previous year.

Plums were a full crop, but European varieties rotted very badly. Spraying seemed to have but very little effect to prevent the rotting, as there were frequent showers about the time the plums were full grown.

The Wild Goose produced an enormous crop and, I am glad to say, brought remunerative prices.

Strawberries were only about a two-thirds crop, but brought a better average price than for the two years previous.

Raspberries were a large crop of excellent fruit; prices low.

Blackberries were altogether too abundant, owing to the immense quantity of wild berries, many of them equal in size to the cultivated sorts, being seedlings from them. The price was very low, not over \$1 per bushel some of the time.

Grapes are not grown to any extent. What few there were, the bunches were straggling, and the fruit inferior to that grown near the lake, which are sold at such a low price that people prefer to buy grapes rather than to give much care or time to growing them.

Vegetables were unusually poor, owing to excessive rains, so the ground could not be worked as it should have been. The same may be said of all farm crops which require constant cultivation to produce good results. Potatoes not over half an average crop; corn good on high land, but poor on low land. On the whole, tillers of the soil have received very meager remuneration for their toil.

The Horticultural Societies are in a very prosperous condition. They are doing a good work, not only for the members, but their influence upon others is very marked, while the interest in the members is increasing, the average attendance is larger, and freer discussions are participated in by a much larger proportion of the members than formerly. In this I can discern an increased ratio of the good that will finally be credited to our efforts to sustain not only local, but the State Horticultural Society.

The president then called for reports from the various local Horticultural Societies, with the following results :

Fulton county, C. H. Waid.
Stark county, S. H. Rockhill.
Franklin county, J. S. Hine.
Muskingum county, George T. Keime.
Lucas county, C. Yeslin.
Clark county, W. N. Scarff.
Montgomery county, N. Ohmer.
Athens county, Wm. Bobo.
Portage county, Frank Ford.
Summit county, L. B. Pierce.
Lake county, E. M. Woodard.
Eastern Cuyahoga county, N. D. Keys.
Central Cuyahoga county, H. H. Richardson.
Lorain county, N. L. Cotton.
Ashtabula county, George T. Watts.
Geauga county, T. L. Roy.

With the exception of the last two all were reported in a flourishing condition

President Cushman: We will now listen to the report of the committee of entomology by Professor Webster, of the Experiment Station.

REPORT OF COMMITTEE ON ENTOMOLOGY.

By F. M. WEBSTER.

To the entomologist the past season has been full of interest and activity, though, I am glad to say, that so far as known to me, no new insect pest has made its appearance in Ohio. A possible exception may, however, develop later on in the western insect known as the Box Elder Bug, *Leptocoris trivittatus*, received through one of Professor Selby's correspondents, from Urbana, Illinois, where it was said to occur in great numbers in residences. This is the first that I have known of its occurrence east of the Mississippi river, and although Illinois is considerably distant from Ohio, yet it will not be surprising to hear of it here at any time, as the species is evidently on the move eastward. As the name would indicate, it attacks the Box Elder, *Negundo aceroides*, and besides, has the habit of congregating in dwellings to pass the winter, much to the consternation of the ladies.

The Harlequin Cabbage Bug, *Murgantia histrionica*, a relative of the above, has been making some fast time in crossing the state from the Ohio river northward. Last spring I did not know of its occurrence over twenty-five miles from the river. Later, I learned of it at McConnellsville, and later Dr. Kellicott observed it near Licking Reservoir; a little later it came to me from Paint Valley, Holmes county, and next I found it at Wooster, where, I have since learned, it injured cauliflower a year ago. Mr. J. S. Hine reported to the Columbus Horticultural Society, in September, that he had received it from West Richfield, Medina county, so that it is likely to have reached Lake Erie this season. It is treated at length in our Bulletin No. 68, of the Experiment Station.

The outbreak of the year was that of the Chinch Bug, *Blissus leucopterus* Say, which seriously ravaged the wheat crop in Brown, Clermont, Highland, Clinton,

Warren, Lawrence and Gallia counties, and the timothy meadows in Ashtabula, Trumbull, Mahoning, Portage and Geauga counties. We have this season sent out over 1,200 packages of the Chinch Bug fungus, *Sporotrichum globuliferum*, and I can, for the first time in my life say, with satisfactory results. I believe we have this year saved the state of Ohio many times the amount allowed my department. I want to call attention to the peculiar fact that, in Northeastern Ohio this insect seems to be single brooded, whereas elsewhere in the state it is double brooded, and except in Northeastern Ohio it is not known to seriously affect timothy meadows. Also, in this same locality, a large per cent. of the adults have only aborted wings, a phenomenon of rare occurrence elsewhere in America, except along the sea coast.

So much time was occupied in aiding farmers to combat the last mentioned pest that less has been accomplished in other directions than I had anticipated would be the case. Several experiments have been conducted against the Grape Root Worm, but the results will not be definitely known until next spring. I find a very gratifying increase of a species of parasite, and also an additional one that is likely to destroy a very large proportion of the eggs of the beetle, and in fact has probably done so this year. There are grounds for encouragement, and a prospect that the worst is now over, as regards the ravages of this pest.

The Rose Beetle, *Macrodactylus subspinosus*, has not been neglected, and I have a good report to render of a somewhat extended experiment carried on by Mr. J. W. Close, of Bellevue. The peach orchard belonging to Mr. Close is situated on a sandy ridge, and the sand has on one side washed down and covered several acres of low but not wet land, and this, with the ridge, is the only sandy land in the vicinity. I, several years ago, demonstrated that this insect would breed, extensively, only in damp, sandy soil, very low and wet lands, the higher and drier ridges being almost entirely avoided. Mr. Close had, several years ago, planted a small peach orchard on this sandy ridge, but the Rose Beetles occurred in such numbers and injured his fruit to such an extent that he became rather discouraged in making any further attempt at fruit growing in that immediate locality. May 10th, 1892, I visited the locality and experienced no trouble in locating the breeding grounds of the pest, in the sandy soil at the foot of the western slope of this sandy ridge, and could not find that any great number were developed elsewhere, though being told by people living near by, that the beetles often appeared in swarms. Previously, this land had been devoted very largely to meadow and wheat. My experiments soon showed that a very slight stirring of the soil a couple of weeks prior to the appearance of the adults, which, by the way, is almost simultaneous with the blooming of the red clover, was fatal to a very large proportion. I asked Mr. Close to hereafter keep this particular plat of ground in some crop that would require cultivation at this season of the year. This he has done, with the result that he has had no further trouble with the pest, and has since become sufficiently encouraged to plant out 1,200 additional peach trees adjoining the original orchard.

Those of you who were present at the meeting of this society in Toledo, when I asked your assistance in securing a fund for special investigations of this sort, will remember my stating that it appeared possible to break up and destroy the breeding grounds of this pest, and protect thereby the orchards and vineyards in the near vicinity. I believe that these four years have not only demonstrated the possibility, but the practicability of carrying out my theory, which is all that I promised to do, and I feel that I have fulfilled my pledge to you. You must remember, however, that this is really only a minor portion of the investigations that I have been able to carry out by the aid of this fund—the only aid that I have been allowed. You will very properly suggest that but few people are in a situation to control the breeding grounds of this pest, as is the case with Mr. Close, and I have fully experienced the truth of this, in my work on this insect, near Ashtabula. One party, Mr. Dunbar, has suffered very severely from the attacks of these beetles, though very few are

developed on his premises. His vineyard is ravaged by insects developed on the grounds of a neighbor on one side, and his peach orchard suffered as badly from those developing on the grounds of a neighbor on the opposite side, thus placing him between two fires, with no means of protecting himself from either. So far as tree fruits, like peaches, apples and pears are concerned, the most effective measure we have found is to collect the beetles as they cluster on the fruit. This, at first, appears to be very impracticable, and, indeed, had that appearance to me, but it was found that the incoming beetles would collect on a few peaches in great numbers, and on these beetles being removed, others, incoming, instead of clustering on fresh fruit, would make directly for that already injured, and gather there until as many as seventy-five would be found on a single peach, so that the few peaches attacked first would, if the beetles were removed, act as continual baits, thus protecting the uninjured fruit. To collect the beetles we melted the top from a tin fruit can, and had a flaring edge of a couple of inches soldered on, and a socket soldered on the bottom, and into this can we put some water with possibly a half inch of kerosene to float on the surface. A light handle was fitted into the socket, and holding this in one hand and a light pine rod in the other, one could place the can directly under the fruit on which the beetles were clustered, when a light tap with the rod would cause them to loosen their hold and drop into the can, where they died almost instantly, and the weight of others, falling on top of them, would bear them down into the water, thus keeping the kerosene uppermost. Hundreds of beetles could be caught in this way, and a stout boy after learning the location of these baits on trees would go over them rapidly, so that the time required was not long, and the expense not great, while the orchard was entirely protected, few of the insects appearing on the second row from the margin of the orchard, and little damage being done to even the outer side of the marginal row. This scheme will, of course, not work in vineyards, but we may be able to devise some other means of fighting the pest there, successfully.

In regard to the San Jose scale, *Aspidiotus perniciosus*, two new localities were reported to me last spring, both near Clay Lick, Licking county. The orchards were visited by me, and again a few days since. The trees originally infested have been cut out and burned, and the remainder will be treated this winter. Of the other orchards, in four cases the infested trees have been burned, and it only has to be seen to that none of the adjacent trees were infested. This will require annual inspection for a few years, though the danger is but slight. In all other cases of the occurrence of this pest, in Ohio, known to me, it has been greatly reduced, so as to render its spread from such orchards very improbable, provided the same course is continued. Of the Clermont county outbreak, I wish to speak in particular. Mr. D. H. Nichols found by experiment that he could apply kerosene to the bodies of his trees in winter, without injury and with the most satisfactory results in destroying the scale. The trunk and stubs of limbs of an apple tree, badly infested with the scale in the spring of 1895, after the removal of the top and a thorough coating with kerosene, applied with a varnish brush, and a new top grafted on the stubs of limbs that had been left for the purpose, was found to be entirely free from the scale last April. The result of this experiment so encouraged a brother of Mr. Nichols, who had cut out and burned the only tree infested in his orchard, before I visited the locality the first time, that he purchased a barrel of kerosene and sprayed his entire orchard, containing 400 apple and peach trees, on February 17th, and, for fear he had not made a thorough job of it, sprayed the entire orchard, peaches and all, again on the 24th of same month, using altogether fifty gallons of kerosene on the 400 trees. I saw the orchard early in April, and the trees had the appearance of having been greased, and the odor of kerosene was all prevailing. I did not say much, but thought several things, among which was that the trees, especially the peach, would never leaf out again. But I saw the orchard on July 10th

of this year, and it was as healthy and thrifty as could be asked for, with the bark as clean as if it had been scrubbed. On mentioning the matter at the meeting of the Association of Economic Entomologists, in Buffalo, last August, the subject precipitated a discussion, and the general opinion was expressed that there must have been some mistake, and that great risk would be run in using kerosene, except in emulsion, in an orchard. Soon after I received the following letter from Professor Smith, Entomologist of the New Jersey Station, which I have taken the liberty of including in this report, and will only add that, if we can use undiluted kerosene in this way, on trees as tender as the peach, it will afford us the cheapest, most practical and effective remedy for this scale yet discovered, as it will penetrate where no other mixture known to us will.

NEW BRUNSWICK N. J., October 21, 1896.

Professor F. M. Webster, Wooster, Ohio.

Dear Mr. Webster: I send you inclosed herewith a copy of a letter which may interest you somewhat. Of course I did not know anything about this matter at Buffalo, but it is curious that so soon after the meeting so strong a confirmation of the Ohio experience should turn up. In fact the experience is even more satisfactory and remarkable than that recounted by you.

Sincerely yours,

JOHN B. SMITH.

October 13, 1896.

Professor J. B. Smith:

Your kind letter of the 12th duly at hand. I first tried pure kerosene oil on a Beurre d'Anjou pear tree early in July, treating several branches at first thoroughly, using a clean paint brush. At expiration of about two weeks I noticed that the treated branches were not injured, but improved in health, as the terminals seemed to be making a more vigorous growth than before the application. I noticed that the San Jose scale was entirely killed. Being thus encouraged I then applied the kerosene as before, but to the entire tree, even to the smallest twigs, and so copiously that the oil ran down the trunk, though not penetrating the ground. I also treated other pear trees—a Seckel and an Idaho, at the same time, about July 20, the result being the same in each case,—the entire destruction of the scale, without injury to the tree, except in one instance. In a fork of the branches of the Beurre d'Anjou, where the bark was thicker and rougher than elsewhere on the tree, the oil seemed to have killed the bark, but not enough is involved to seriously injure the tree.

About October 1st I applied kerosene as before, to the trunks and larger branches of several peach trees, which were thickly encrusted with the scale, the uniform result being the total destruction of all scale reached by the oil, and as far as I can discern without injury to the peach trees. I would state that the peach trees are unusually vigorous, hence have resisted the scale attacks better than have the slower growing pear trees, and for the same reason are safer subjects for the kerosene treatment. My fruit trees are on Jersey City Heights, in a thickly populated section—southern aspect, well protected, soil a very fertile sand loam. My deductions from these experiments are that a single application of kerosene oil will not injure any vigorous tree, but is instantly fatal to the scale. Should the oil be applied to an in-feeble tree, especially if under such conditions that it could not quickly evaporate, it would probably be harmful. I conclude that the most favorable time for such application would be when the tree is rapidly growing, when the scale is most active,

and when hot weather would favor rapid evaporation of the oil. It seems to me that such a time would be July.

I hope to continue this treatment next season on other trees, carefully noting results. Would like to hear from you upon this and kindred subjects. I am an enthusiast in fruit culture, and if at any time my observations can be made available by you they are at your service.

Respectfully yours,

M. H. KELSEY.

I ought, perhaps, to refer to the seemingly anomalous condition of the laws in some of the Eastern states, demanding that trees shipped from Ohio and other states be accompanied by a certificate of their freedom from San Jose scale. It appears that the states of Virginia and Maryland have, finally, woke up, something that it seems to me would have been perfectly in order three years ago, and are now honestly attempting to stamp out the scale and keep it out, if possible. They could not well make an exception of any other state, as nursery stock is sold and conveyed from one state to another among nurserymen, and it is impossible to make an exception in this case without running into the very danger that is now possible to be avoided. Besides, I cannot promise that all Ohio nurseries are above suspicion, though I have no proof against any of them. Then, the same measure that demands the inspection of Ohio trees enforces inspection of eastern nurseries, which, if it had been done before, we would have had no trouble. I would advise a proper obedience to the laws of these states, because Ohio has probably little to lose, and very much protection to gain by their proper enforcement at home.

I have long had in mind two Bulletins, one treating of strawberry insects and the other of peach insects, and hope during the year to be able to carry out the plan.

As previously stated, all of this work is carried on on the strength of the fund this Society has been the chief agent in securing, and which is now \$1,000 per year, from which must come all expenses, including pay of an assistant, and I wish to assure you that I fully appreciate the support given me by this Society, and I thank you very sincerely therefor.

Professor Webster (continuing): In regard to the San Jose scale, I might say this year seems to have been a bad one. There are two orchards in the state badly infested, and this year with the opening of spring so very early, and being so warm, they seem to have appeared in great abundance. They are in the hands of good men, who say they will not refuse to sacrifice the orchards to get rid of the scale, if they have to do it.

Mr. Woodard: Is there any other way to apply this kerosene than by spraying?

Professor Webster: Yes, it was applied to this orchard of 400 trees with a barrel sprayer. Of course, there is more or less loss there, but it can be applied that way, and also with a brush.

Question: Is that the refined or crude oil?

Professor Webster: It is the refined, but of course there are different grades. This was 150 degrees flash test. There may be a difference between a light and heavy grade. We have to make some experiments before we can state definitely. This kerosene was bought in Cincinnati, and was supposed to be precisely the same as used in the lamps.

Mr. L. B. Pierce: Professor, was the rose bug plentiful in other sections? Didn't the rains have something to do with it?

Professor Webster: They were swarming elsewhere.

Question: Was the experiment this year or a previous year?

Professor Webster: The ground has been stirred ever since 1892. Since that time Mr. Close has taken pains to keep the plat under cultivation, or keep it in some crop that needs cultivation along the latter part of May and June, and during the years since 1892 he has had no trouble.

Mr. Hine: In regard to the chinch bug, I have seen it stated that the rainy weather had some effect in keeping them in check, especially the younger ones. What has been your experience?

Professor Webster: Now, that is a little peculiar. In these southern counties they got scarcely any rain until after the 10th of June. That gave the chinch bugs an immense advantage. I might say that ordinarily the rains must come in the season when they are hatching, but if they get to be a week old it don't hurt them much. Now, in the eastern part of the state I am puzzled out. I have been watching the chinch bug for twenty years and it is a puzzle. It is possible that there may have been, for perhaps three or four weeks, not enough rain up there, just in the season, but if they only have one brood, we are a little at a loss, and will have to have another year in order to get more data; but I think that is correct, that if the rain comes in rather drenching showers during the hatching season, it will keep them down.

The President: Following the report on entomology is the one on Forestry, by Professor Lazenby.

Professor Lazenby: Mr. President and Members of the Society. In the spring of 1882 we planted the seeds of a considerable number of what were supposed to be the most valuable forest native trees of Ohio, and since that time they have been growing on our grounds. We have taken rather careful measurements, and all I wish to do to-day is to call your attention to a few of those that seem to be promising as varieties that might be started upon some of the cheaper and poorer lands of the state. The most rapid grower was the yellow locust. This has attained a diameter of ten inches, and it came from seed planted in the spring of 1882. There are a few a little larger than this. Quite a number have attained a diameter of ten inches and a height of something over fifty feet.

Mr. Pierce: What height from the ground were they measured?

Professor Lazenby: Two feet from the ground. Quite a large per cent. of the locusts have been injured by the borer. Perhaps Professor Webster can give us a cheap and effective remedy for this pest. I do not know whether it would be safe to recommend the planting of this locust largely.

The next most rapid grower, and to me somewhat of a surprise, has been the black cherry on our grounds. Of course I am speaking now with reference to our own soil and situation. It has grown remarkably well.

Mr. S. R. Moore: The wild black cherry?

Professor Lazenby: The native black cherry; yes, sir. It grows tall and straight where planted quite close together, and although one would have to wait some years for returns, I believe that in the end a very fair profit might be secured from some of our land if started with black cherry.

Mr. Longenecker: What size are they?

Professor Lazenby: About the same as the locusts. The locusts averaging a little greater diameter than the cherry, and the cherry a little taller than the locusts. These trees came from the seed planted in 1882. Some of them were started in nursery rows and then set out.

I want to recommend the Western Catalpa,—the *Catalpa speciosa*—for planting. It grows readily from seed, and is quite straight when planted thickly, and that is the way it should be planted. We began using some of these *Catalpa* for stakes for tomatoes, Lima beans, etc., three or four years after planting. We used them as small posts for wire fence the sixth and seventh year. I think highly of the Catalpa. The wood seems to be extremely durable, and they are entirely free of insect pests so far as I can see, and if planted thickly they will grow straight and tall. Where we plant trees for timber we want a tall, straight trunk, and we can get them by close planting many of these varieties.

The next is the white ash. That has also done remarkably well. I have rarely seen finer, straighter young trees than the white ash, and although we have not had enough to make a study of the market for them, I have reason to believe that some of those young ashes might be used, if grown in quantity, for various purposes. They have to be planted quite thick if you wish to stimulate a rapid upward growth.

Mr. Moore: Do not the borers destroy them a great deal?

Professor Lazenby: No, sir.

Mr. L. B. Pierce: I have been entirely unable to obtain a market for some very fine young ash from fifteen to sixteen inches through, because there was no market. There is a limit. They can be used for neck-yokes if they are big enough. For young ash there is a home market for making your whippletrees.

Professor Lazenby: I do not know but they were used to make hoops. There is one thing certain about the white ash. When it gets older there is a demand for it. Our Columbus buggy companies are at a greater loss to get ash than any other varieties.

Mr. Ohmer: Most all of the factories use more or less ash.

Mr. Whitney: There is plenty of demand for it.

Professor Lazenby: If it is the wish of the secretary I can prepare

a few figures for publication. But the point I wish to make is this: Is it not a fact that here in Ohio we have a great deal of rough and ragged and rocky hillside, especially the southern and southeastern parts of the state, that cannot be cultivated with profit, that is yielding very little now in the way of pasture perhaps. Would it not pay to devote many of these acres to timber? Of course the difficulty is in making the start. I am satisfied that many of our varieties can be grown from the seed without very much trouble. Collect this seed in quantities, sow it very thickly, and if a great variety is scattered on the surface and the stock and fire are kept away the trees will grow. It is surprising how productive our land is, but in this case we must guard against fire and stock. These seem to be the two great enemies of our timber trees, and although we would have to wait some time for return, a great many of our acres have never yielded us any crop, and they would give a return if we would get them once started with our best varieties of native timber trees.

Dr. Aldrich: I would like to ask Professor Lazenby whether the *Catalpa speciosa* would grow on that high, rocky land.

Professor Lazenby: I presume it would not grow as well. I think on our sandy ridges the chestnut would be better, possibly the tulip.

Dr. Aldrich: Upon that subject, Mr. President, I would like to say that with the present price of the black walnut, that in the locality where that tree grows naturally, it can be as profitable a timber tree as anything that can be grown. I went to the state of Illinois in 1859, and a friend of mine had three or four years before that bought and laid out a new farm. There was no timber at all there, and he wanted a wind-break for his house, and he got two or three bushels of walnuts and planted them in rows about eight feet apart and about three feet in the rows, put in from half an acre to an acre of ground; and at the time I was out, it was only three or four years afterward, they had reached a height of ten or fifteen feet, with a diameter of two or three inches. I saw the trees fifteen or sixteen years after that and they had kept up a very nice growth. Where the black walnut can be successfully grown I believe it would be very profitable for timber.

Secretary Farnsworth: It is a little risky from a financial point of view to plant anything where we are obliged to wait so long for a return, as it is with this class of timber, unless you feel that the market will never depreciate. Now a few years ago I remember of hearing people speak of the immense prices of black walnut. Some four or five years ago I purchased fifteen acres of timber upon which there were a number of fine walnut trees, and I thought I had something of value. We cut the logs and looked around for a customer, but could not find one. I stored the lumber away in my barn and kept it for two or three years, and finally got a customer at \$15 per thousand, while they were offering \$30 for quarter-sawed oak.

Mr. Moore: Within two months there was a gentleman at my house who is making it a business to buy walnut logs and ship them to a foreign market. He is hunting around over the country at all times. It seemed to me that he paid very handsome prices for good walnut logs, and he seemed to think that the demand was not diminishing at all.

Secretary Farnsworth: I wrote a number of furniture factories, and they all wrote that walnut furniture is out of style.

Professor Lazenby: In support of what Mr. Moore says, we have a good number of good-sized walnut trees on the University grounds, and there has never been a year but what one or more parties have called to see if they could not get black walnut lumber. We sold three last winter. This man was very fearful that they were hollow, but he took them at his own risk, removing the stump and clearing and grading the ground. He gave us \$35 in cash for the three trees.

Mr. Livingston: I would like to say a word or two on this tree question, and I know very little about it, only by experience and observation. I remember in going over the country in Mississippi—as I traveled all over the Southern states for three years—I kept looking out on one side of the road, and I saw right through the timber the plowed ground, and there was the timber growing just as thick as it could be. On some lands it was 100 feet high, and on others again not more than 75 feet. Those trees 100 feet high grew close together and they grew straight. On other kinds of land they were branching out and not so close together. Now, I would never thin them out. Nature will thin them out when it becomes necessary; because if you thin them out you have got to let the limbs spread out. In 1880 I went to Iowa, and on a piece of ground that we purchased, which was owned by nurserymen, there was what they called a larch grove. It looks like an evergreen. They were a little larger than those table legs and a good deal closer. You could not drive through, and they grew about fifteen or twenty feet high. They were about the size of a good big pitchfork handle. When I came away, about nine years after that, they were about the size of a big boom pole on a wagon and thirty feet high. Now, I fancy that this land that is wasting, that is good for nothing, is being kept for the generations yet to come. It is beneficial, I think, to have a little timber on the lands, anyway, and I think it is necessary. This ash timber is used for fork handles, singletrees, and doubletrees of the very finest quality, and I think the only way for us to do is to encourage as much as possible the growth of this timber.

President Cushman: We instituted a new committee last year as one of our standing committees, and we chose Professor Selby to act upon that committee, who will now present his report on Vegetable Pathology.

Professor Selby: I do not wish to extend the forestry discussion, but to take this opportunity of asking if any of you know of white ash

trees within reach with abundant seed, to notify me between now and Friday. I am trying to secure a quantity of white ash seed, which I have not been able to do this season. The reason for this is to supply a demand for some experiments to be inaugurated in the Experiment Station, in cooperation with the United States Agricultural Department

REPORT OF THE COMMITTEE ON VEGETABLE PATHOLOGY

By AUGUSTINE D. SELBY, Wooster, Ohio.

It is noted that the Committee on Vegetable Pathology has been instituted since the last annual meeting at Canton. It, therefore, submits a First Report. For various reasons it seems proper to take up some matters previously before the Society, and to begin with

PEACH YELLOWS.

Following out recommendations made by this and other bodies of horticulturists, the 'Yellows' Black Knot law was amended last winter, and made to include trees affected with San Jose scale. The requirements of the present statute, with respect to yellows and black knot, appear free from serious objection. It is possible that the provision for gathering the statistics through assessors and addresses by township clerks may prove inoperative. The trustees still refuse to appoint Fruit Commissioners in places, and under such circumstances the remedy is to mandamus them through the courts of common pleas.

In no case reported this season, has there been failure to secure a board of commissioners when the trustees have made appointments. The fruit growers must take the initiative, by petition, which appears entirely fitting. There has been a good deal of neglect in destroying the yellows trees, and the consequences are beginning to be realized in some localities. Upon this matter of prompt destruction by fire, too much insistence cannot, in my judgment be placed.

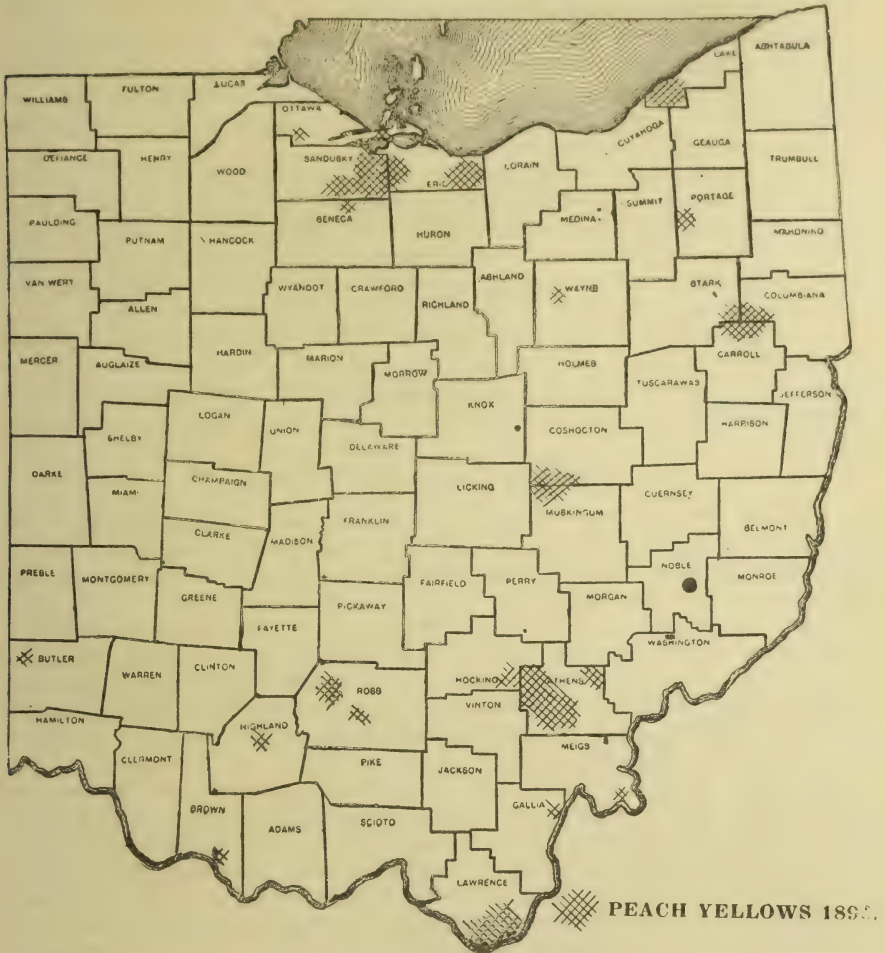
Some specimens of yellows branches were received from township trustees, for report, although little or no dissatisfaction with the work of the Fruit Commissioners was made known.

In accordance with the requirements of section 3 of the statute, Bulletin 72 of the Ohio Experiment Station was prepared and published, having been distributed to affected districts during August. It was sent in quantity to commissioners and societies, upon application. A reserve supply of it is still on hands for distribution to those who apply. It is but justice to the Experiment Station to recall that no special appropriation was made for the publication of this "special bulletin."

The distribution of yellows in Ohio may be seen by reference to the map.

A large number of peach growing districts yet remain to be examined. At present, yellows is known to occur in the counties of Athens, Brown, Butler, Carroll, Columbiana, Coshocton, Erie, Gallia, Hocking, Lake, Lawrence, Muskingum, Ottawa, Portage, Ross, Sandusky, Seneca, Stark and Wayne. No doubt there are other counties in which the disease occurs, but it has not been demonstrated to exist. In very few of the counties does yellows extend over the whole county, although in some of them this is true. The distribution in this county, Athens, is, perhaps, as general as in any other, while Lawrence, Erie and others are little, if any, better off. In one case, it is thought, a case of yellows in the apricot was seen.

The state of Maryland now requires certificates of exemption from yellows and some other pests upon nursery stock shipped into that state; no such certificate is



required concerning the stock grown there, in Delaware, and in other affected districts, which may find its way into Ohio. You are able to draw your own conclusions upon this subject.

ROOT OR CROWN GALL ON FRUIT TREES.

In one case six per cent. of a lot of several hundred Smock peach trees, from a Michigan nursery, were found affected with galls or knots upon the roots and stems. In the bundles of trees it usually occurred that two or more trees with the galls came together. This indicated that they grew alongside each other, and that the infection spread. A peach tree in my own garden, at Wooster, variety Early Rivers, made a good growth in the season of 1895, but was dead from crown gall within a year from planting. A like disease of plum, cherry, apple and pear yearly becomes more prominent.

A plantation of root-galled apples and peaches was set out at the Experiment Station last spring.

FUNGIOUS DISEASE OF THE PEACH.

The past season has furnished favorable conditions for the fungous growths. The weather is not to be regarded as the cause of rot, scab, etc.; the cause was in existing spores. And of spores there is certainly an abundant supply for next season. Rotted and dried or "mummy" peaches that still hang upon the trees will carry the rot fungus over winter to attack both twigs and fruit. Many of you have already, without doubt, noticed how many twigs and branches bearing rotten fruit were killed by the rot fungus during the season. The removal of these mummies and branches, during the winter is recommended.

I never before saw so many black spotted and cracked peaches as the past season. This black spotting of skin and cracking is caused by the fungus of peach scab, (*Cladosporium carpophilum* Thum.) It also causes "shot hole" effect on peach leaves. Spraying experiments in its prevention, as well as the repression of other peach diseases are to be reported on at another time. The brown or pustular spot has been seen in Highland, Portage and in most parts of Ottawa county.

A stem disease of heeled nursery stock in Erie county, and of branches of larger peach trees in the same and other districts, has caused a good deal of anxiety. This is evidently a fungous disease due to a species of *Phoma*. Cutting and burning diseased parts is a good practice.

DISEASES OF PLUMS AND CHERRIES.

The one distinguishing feature of the season was the rot in both plums and cherries, as well as in peaches. Removal of rotting plums proved about the best preventive. A small experiment at Gypsum, carried out by the Station, through the cooperation of Mr. William Miller, shows that Bordeaux mixture can delay the rot. In that trial the unsprayed trees were affected some three weeks before the fruit on the sprayed trees began to rot. It is possible that better results still, would be obtained by continuing the treatment almost to gathering time, instead of ceasing early, as was done in June. In case of late spraying the ammoniacal solution of copper carbonate would be easier to remove from the fruit, and perhaps, equally as effective as Bordeaux mixture.

Many plum trees lost their leaves in August and September, and some of these put forth new leaves and blossoms. The cherry trees also dropped leaves to a certain extent, and the foliage was badly spotted. In both cases microscopic examination shows the trouble to be due to the same fungus, (*Cylindrosporium padi*; *Karsf.*), called "shot hole" fungus for the plum, and leaf spot for the cherry. Where the plums have lost their leaves and put forth anew in leaf or blossoms, the prospect for a crop of fruit next season is very poor. The chances are against any at all. Professor Green has shown conclusively, from experiments in 1891,* that Bordeaux mixture effectually prevents the shot hole fungus, while Paris green, used alone, aggravates the trouble. It is to be noted here that where this fungus causes early dropping of the plum leaves, the fruit fails to ripen properly. With the cherry trees at the Station in 1896 the unsprayed trees had the leaves badly spotted, while the sprayed ones, of all varieties, were comparatively free from it. Unless the indications of this season are at fault, cherry and plum growers will have use for Bordeaux mixture in 1897.

Since the old stock of plum and sour cherry trees over the state has been destroyed or diminished by black knot, there is rather less of this disease noticed. The "fence corner" trees are likely to continue to suffer from it, and all other neglected trees as well.

* Bulletin Ohio Experiment Station, Vol. IV, No. 9.

BLIGHT OF APPLE AND PEAR.

The twig blight of apple was quite prevalent in the early summer months. At times the blighting was mistaken for frost effect. This trouble is bacterial, and caused by the same organism. (*Micrococcus amylovorus* Burril), as that which causes the fire blight of the pear. On the apple no large blighted branches have been observed, and the disease is confined to smaller branches and twigs. For this reason no great destruction of apple trees occurs. Pear blight is complained of rather less than in 1895. Thorough winter removal and burning of the affected parts on quince, apple, pear and wild species will destroy the resting germs. This should largely prevent the blight.

The Year Book of the United States Department of Agriculture for 1895 contains a fifteen-page article upon pear blight, which represents the latest and best work of a specialist in that line. It is worth reading. In passing apple troubles reference may be made to the small spots or specks in Baldwins, known as Baldwin bitter rot. This occurs to a considerable extent.

DEFOLIATION OF CURRANTS AND GOOSEBERRIES.

Currant bushes in Northern Ohio dropped their leaves prematurely, and the same was true, to a less degree of gooseberry plants. This has been caused with currants by leaf spot fungi, perhaps of two or more species, and in the case of the gooseberry by the mildew leaf spot fungi. I am convinced that a shortening of the crop is likely to follow such early loss of leaves, and that the use of Bordeaux mixture will be required next season in some plantings.

Pammel* has shown that this fungicide will prevent the loss of leaves on currants. Experiments in Ohio upon a larger scale might prove valuable.

NEW DISEASES OF GARDEN PLANTS.

I have noticed, the present season, two fungous diseases of the tomato, for the first time. These are, perhaps, to be increased by a bacterial one. Of the fungous troubles, one, the anthracnose (*Glæosporium phomoides* Sacc.) spots the fruit, and the other, the leaf blight (*Septoria lycopersici* Speg. (?)) attacks both the leaves and the stem, thus cutting short the crop. The leaf blight was observed at Marietta, Columbus and Wooster, but not in the larger garden at the Station. The leaf blight is not to be confounded with the tomato leaf spot, which so nearly resembles the early blight of potatoes. The spots of the blight are much more numerous than in the leaf spot, and the injury vastly greater. This leaf blight attacks, first, the end or terminal leaflets of the older leaves, causing small spots about an eighth of an inch, or less, in diameter and of an ash gray color, when viewed from below. As the disease spreads, the whole point of the leaflet dies, and the succeeding ones in turn. The leaf stalks and stem finally become spotted and more or less dead. Bordeaux mixture has proved a remedy for the leaf blight in New Jersey, according to Dr. Halsted, and the best preventive of anthracnose. I would inquire if these two troubles have prevailed at Athens?

The anthracnose of the watermelon (*Colletotrichum lagenarium* Pass.), which produces dead, sunken spots in the rind, has been observed at the Experiment Station. The same fungus attacks cucumbers, resulting in much loss, and causes the spotting of bean pods; in New Jersey this is described as the worst disease of cucumbers, but it has not yet been observed in Ohio. The cucumber scab, *Cladosporium cucumerium* Ell. Arthur) which produces more superficial spotting and less rotting, comes from Mahoning county. The scab is likely to cause greatest injury to the pickle grower.

* Bulletin 13, Iowa Experiment Station. See also Bulletin 30.

THE DOWNY MILDEW OF CUCUMBERS.

(*Plasmopora cubensis*) already infests greenhouses and has, likewise, appeared in the gardens, as it has done previously in the East. A new leaf blight of nutmeg melons, (*Alternaria* sp.,) has been very destructive about Wooster for two seasons. It begins in the leaves, producing dead spots one-fourth to three-eighths inches in diameter, and finally the leaves die from the points and margins backward. It appears to come rather late and to affect the later more than the earlier crop. It can probably be prevented by spraying with Bordeaux mixture.

A DISEASE OF GLADIOLUS CORMS.

Spotting and rotting of Gladiolus corms has been complained of, among growers, for several seasons. Corms for experiment were donated to the Experiment Station by President Cushman. The results, in a preliminary greenhouse trial, with flowers of sulphur upon the corms, were favorable to the treatment. The outdoor trial, the past season, showed poorer growth and preservation of the treated than of the untreated.

Confessedly, the report of this committee is far from complete or full concerning what is referred to. Questions may bring out any troubles or phases not mentioned.

Mr. Brawley: I would like to call your attention to this fact, that our professors tell us that it is necessary for us to find out where the black-knot and the yellows are and to report them to some authority, either at the Experiment Station or elsewhere. The professor mentioned that some townships refuse to appoint persons to investigate and report on it, and that prevails in a number of townships in this county and I presume does in other parts of the state, and I know of no quicker way that we can get at that thing or better way to serve the fruit-growers, than for the assessors to take the matter in hand. Our legislature does not meet this winter and we can get no legislation, and I hope that in whatever seems necessary this Society will act.

Secretary Farnsworth: Professor Selby's remarks in regard to the effects of spraying for the shot-hole fungus with Bordeaux mixture, received a very strong exemplification in our own neighborhood. My own plum orchard was sprayed with Bordeaux mixture and the foliage was preserved perfectly. Two other orchards near by lost their foliage almost entirely early in August, and one of these orchards was loaded with fruit, but the fruit failed to mature properly. It was inferior in size and quality, and after the fruit was removed and the latter rains came on, the leaves again appeared and it bloomed a second time in the fall. I had a cherry orchard which I did not spray for the reason that we had not been troubled with any fungous diseases, and if my recollection serves me right, a few years since the Experiment Station had made tests to prevent that trouble, or at least I supposed it to be the same trouble in the cherry, and that it was considered a positive damage, and therefore I did not spray. But my trees were largely defoliated in September or possibly in the latter part of August. The foliage assumes more of a yellow hue than it did on the plum, and if the spraying with Bordeaux

mixture is effective I shall apply it next year, because I use the Bordeaux mixture very largely and I hope to have further assurance on this line that the Bordeaux will be a remedy for that.

Professor Selby: Perhaps I might qualify right there on cherries. In some spraying experiments there has been a good deal of foliage injured with the four-pound mixture. I asked, and it is my recollection, but I have not a written memorandum, that the four-pound mixture was used throughout this year on the cherries at the Experiment Station, but certain it is that the half-strength mixture will not injure the foliage. The two-pound mixture was used at Station.

Secretary Farnsworth: That is, the two-pound mixture?

Professor Selby: Two pounds of copper sulphate and two pounds of lime to fifty gallons, and it has proven a very effective fungicide in a general way. Mr. Woodard, in the appearance of the currant leaves was there anything more than the spot?

Mr. Woodard: Yes, sir, there was a mildew.

Professor Selby: I have never seen mildew on currant leaves, and if you have any, I would thank you to send me some.

Mr. Woodard: I now move that we adjourn to seven o'clock this evening.

Motion carried.

EVENING SESSION.

The President called the meeting to order promptly at seven o'clock pursuant to adjournment, and announced that the convention would be favored with a solo by Mr. King. Mr. King sang to the great delight of the audience, after which Mrs. Helen Burns, of Athens, was introduced and read a most interesting paper as follows:

FLOWERS IN THE HOME.

"Flowers are love's truest language, they betray
 Like the divining rod of Magi old
 Where precious wealth lies stored away,
 Wealth, not of gold, but love
 Strong love that never can decay."

The question of prudence before any expense or exertion, is "Will it pay?" Not necessarily in gold or gear, but in any good. So our subject comes before the same stern inquisitor and the interrogation is, "What are the benefits of the cultivation of flowers in and about the home?" Let Wordsworth first bear testimony and tell us of the daffodils. He says:

"I wandered lonely as a cloud,
 That floats on high o'er grave and hill,
 When all at once I saw a crowd
 A host of dancing daffodils.

'The waves beside them danced, but they
 Outdid the sparkling waves in glee,
 A poet could not but be gay,
 In such a jocund company.
 I gazed and gazed, but little thought
 What wealth to me the show had brought.

"For oft when on my couch I lie
 In vacant or in pensive mood,
 They flash upon that inward eye
 Which is the bliss of solitude,
 And then my heart with pleasure fills
 And dances with the daffodils "

These beautiful words convey the true idea. The influence of the beauty and perfume of flowers is faith-inspiring, care-lifting and joy-giving. Nor do they bloom alone for poet's fancy, or for lover's sigh. They bring helpfulness into the poor man's cottage and the stately palace. They have been well called, "The smile of God," "The alphabet of the angels" and "The overflowings of the cup of Infinite love." And it is because they have been the source of nobler, holier emotions. In myth, legend and story, the thought of love, sympathy and tenderness is indissolubly bound with the fair blossoms that deck the tended garden or spring unshielded by the wayside.

Who can look into the heart of a rose or inhale the odor of violets and continue to think the All-father indifferent to his needs and burdens? Insensibly there rises in his heart the words, 'Wherefore if God so clothe the grass of the field which to-day is and to-morrow is cast into the oven, shall he not much more clothe you, oh ye of little faith.' We, the common people, and the women especially have little recreation. In our country and village homes, no trip to the seaside or mountains in summer, nor the city in winter. No museum or gallery of art. It is a rare day indeed when there is festivity or mirth. Life moves on a dead level. The thing we did yesterday we are doing to-day and we shall do to-morrow. It is in a sort of desperation that some women affect art and waste good paint in creating marvels of ugliness, or bend over interminable embroidery, outlining impossible flowers in unheard of hues, to the great injury of eyesight, or they create fancy affairs whose name is legion, more airy and fragile than our children's castles in Spain—only to fade, gather dust and be consigned to oblivion. Rather let us hold high converse with the great and good until our eyes and minds are weary and then go forth to commune with nature.

Emerson says, "Give me health and a day and I will make the pomp of emperors ridiculous." The freshness and beauty of the morning, the splendor of the noon and the glory of the dying day are ours. But we are not Emerson to bring down glory and beauty of sun and cloud and evening star and place them close beside our task. So instead we should bring into our homes to enjoy, that which is child of the sunshine, the dew drop and the balmy air—that bears its likeness to sunset cloud and bow of promise, and has beside a breath of fragrance found nowhere else in the broad universe.

The influence of flowers is like that of music or art in its highest expression. Like the thought of a great author, they are the *tender* thoughts of the Creator of all beauty and harmony. Perhaps the first attraction is found in form and color, but there is a subtle influence in fragrance, especially in that of flowers which we knew in pure and happy childhood. So a bunch of May pinks, such as grew in mother's garden, has caused more than one wayward girl or wandering boy to hesitate, halt, turn and retrace steps that were drawing perilously near the quicksands

of pleasure, folly and despair. Eternity alone can reveal all the ministrations for good in the modern Flower Mission. Into prison, hospital, infirmary, jail, hovel and den go these messengers of human and divine love, bearing no maudlin sentiment, but a divine truth, "Not willing that any should perish."

Premeditated ugliness is a sin if not a crime. The way some people build their dwellings, falsely called homes, reminds one of the Hindoo law, which prohibits a widow from eating palatable food, wearing beautiful clothes or even thinking pleasant thoughts, bare, bald, forbidding; no veranda to protect from heat in summer or storm in winter, no sheltering tree, no well kept lawn, may be not even a fence to protect from the marauders of the poultry yard. Now a very plain old house may be made so inviting within and without, such beauty and fragrance of climbing vines and clustering roses, honeysuckles and clematis vieing with each other in their wealth of bloom, that it makes a picture one gladly recalls. Seeing it you linger, and leaving you would fain look back again.

Then cultivate the acquaintance of flowers and learn to use them. Decorate the dinner table, put a spray beside each plate at breakfast, let them speak a welcome at eventide.

Let mirrors reflect them. Twine them around the pictures. Let the home be glorious and redolent of them on anniversaries and holidays. Let each member of the household have his favorite, and an interest in the general store.

Cultivate flowers and *give* them. What so appropriate a gift to the sick, sorrowing or bereaved one, as a blooming plant. None too rich to accept such token of kindly thought; none too poor to enjoy the blessed benediction. Too ill to speak, one gains faith and strength by "considering the lilies."

A sensitive child under quarantine was made the recipient of a blooming rose. He gazed long and fondly at its bright petals and glossy leaves, and then said: "Mamma, I think God sent that lady with this flower to show that He remembered us, because last night I told Him that everyone had forgotten us."

If you have not queenly roses and japonicas in waxen beauty cultivate an acquaintance with their lower cousins. Our common apple blossom is more beautiful than the far-famed orange flower of summer climes, and no description can do justice to the color or fragrance of the wild crab tree in bloom.

Perhaps all are ready to cry enough. We do love flowers, and we recognize their mission, but how can we have them without great expense and costly appliances—conservatories and greenhouses—when we need their gentle ministry the most? The chrysanthemums have gathered and held all the glory of the summer sunshine. They have lingered with us long. Though once called the Christmas rose, and hailed by us as queen of autumn, her dethronement is near. Then who shall we crown in her stead? You shall hear. The opening buds of the fairy joss flower display already their hearts of gold, and ere this marvel has ceased to charm us the bulbs long hidden in moist, cool loam, will be mistaking the warmth of a sunny window for veritable springtime, and for Christmas guest and New Year's callers there will be white narcissus and Roman hyacinths. Not so sturdy and showy as the old Hollanders, but having a delicate beauty and fragrance that make them even more delightful. These will be succeeded by freezias and the wonderful Dutch hyacinths that surprise us continually by its display of tints and size of bells with forty or fifty flowrets on a single stem.

By prudence and good management these may be made to give out their imprisoned summer beauty when the frost king reigns supreme beyond the threshold. Tulips and daffodils, with other favorites will follow, lingering perhaps to greet the crocus and snowdrop beneath the window. If this window looks to the south the heliotrope will reward your care with exquisite fragrance, not to speak of geraniums in every variety of color. Occasionally there may be a rose or carnation, but for the most part one must depend upon the bulbs for blooms during the holidays and

the gloomy months that follow, and there are numberless begonias, too, whose every leaf is a blossom and every blossom a gem. But if you hope to have these you must fence carefully against the frost, filling every crack around the window with cotton or covering them with strips of cloth or paper, and by passing a newspaper between the window and the plants when the air is sharp or the wind high. It would be beyond the limit set for this paper to speak of the profusion of summer flowers, or to name favorites among the almost countless host. But begin to plan for them early. Send to the seedsmen for catalogues. None better than Livingston of our own state. Study the guides. Learn what would be best suited to your locality. Use a little time every day in preparing for and cultivating. It will bring vigor and strength and add years to your life. But learn to grow perpetual blooming roses. Don't fail to plant nasturtiums; they make a beautiful screen, or cover an unsightly fence to perfection. Give pansies and asters a place, with mignonette and alyssum. Be sure to have sweet peas if you have a sunny spot and—but no—time fails.

"Sweet letters of the angel tongue
 We've loved you long and well,
 And never have failed in your fragrance sweet
 To find some secret spell—
 A charm that has bound us with witching power,
 For ours is the old belief,
 That midst your *sweets*, and *midst* your bloom,
 There's a soul in every leaf."

Miss Castle, of Athens, also sang a beautiful solo, which was greatly appreciated.

Professor Cushman then delivered his annual address, as follows:

Friends and Members of the Ohio State Horticultural Society:

Custom makes it the duty of your President to deliver an address, a president's message, if you choose to term it as such.

In meeting in this city of the hills, we come by invitation of the youngest local society of the state, and it is to be hoped that the influence emanating from this gathering will give the young organization power, strength and vitality to become an Athens of horticulture, and to hold its passes against all odds, and may its wonderful accomplishments shine down the centuries of time as does that ancient city of Greece.

Last year we met with two of the oldest societies in the state. It was a pleasure to meet with societies which have done so much for all branches of the profession in their immediate localities, and stand to-day as shining examples of what local societies may hope to aspire to. Their members refer with pride to the elevating and inspiring effects emanating from their monthly gatherings. We hope that you, as time rolls on, may look back and see the good effects of your association. May the time soon come when you can produce two first-class fruits where but one grew before, and at *half cost*. Ohio horticulture in all of its branches is making wonderful strides. Our state possesses some of the finest fruit growing sections in the world. They are as famous as that of any other state, not excepting that western monarch, California.

It is the mission of this Society to assist in developing all of the possibilities within the reach of commercial horticulture latent in the state. To that end we meet with you in convention. I have always been an ardent advocate of local horticultural improvement societies. I still believe that this is the most advantageous field for the state society to work in. Commercial horticulture, from the selfishness

connected with it, is able to take care of itself. Social and ornamental horticulture are the branches that most need encouraging. These can be reached most successfully through small organizations, which meet oftener and for other than selfish reasons.

I urge upon this society the necessity of putting this branch of the work in a more aggressive condition. It is not only necessary to effect organizations, but in many instances it would be well to make provision for some state officer, or other person qualified to lecture, to visit such societies and help them to acquire a firm footing. There is a demand for such visits from some one, and it is part of our duty to fulfill it.

The proper nomenclature of fruits is of considerable importance to horticulturists. The correct naming of varieties can nearly always be left to local societies, but there should be more prominence given to our Nomenclature Committee. It would seem best to reorganize this committee, and put it on a working basis, and give them a place on our programme. To them should be referred, as far as possible, all disputes that might arise. They can and should do work on the exhibition tables at the State Fair, and let this society know to what extent incorrect nomenclature is practiced. Another good work they could do would be to pass upon the naming of any fruit that might be sent out by members of this society or from the state, thus insuring its permanency from the beginning.

At our last February meeting I appointed three committees, State Fair Premium List, Revision Constitution and By-laws, Posting Fruit List at State Fair. Their reports will be placed before you. They doubtless will contain matters worthy of your further consideration and action. The resolution passed at the February meeting, asking our Secretary to correspond with the various State societies as to the possibilities of a delegate convention to consider means of preventing the spread of noxious insects and fungous diseases, by appropriate state and federal legislation, has been attended to, and will doubtless be presented to you in the Secretary's report.

I am still strongly impressed of the advisability of some such effort, and hope the way may be opened to secure such action as will especially prevent the free distribution of our fruit and vegetable foes. There should be an organized effort to do the work. I am pleased to call your attention to the fact that every change recommended by this society was enacted in the new Black Knot and Yellows law.

At our last meeting it was recommended that sectional meetings be held by this society. There is a demand for these meetings, and it should be met as far as our finances will permit. As our constitution is undergoing a change, would it not be wise to take such action as to permit the committee to make provision for holding these meetings. It is of considerable importance that they be given a title and conducted in a manner giving them an individuality as dissimilar from the present institute work as possible. If we could make them horticultural schools where the principles of the various branches of fruit and plant growing could be personally explained by competent instructors, it would be the means of starting many on the right track and save both time and money to them. Conducting these horticultural schools and organizing local societies could well go hand in hand. I would like to call your attention to the value of statistical information that might be furnished by the members of our ad interim committee. Besides it being of general interest, a knowledge of the value of the fruit crops of our state, as stated before, this Society might give us the ammunition whereby we could secure more of that glittering gold and shining silver we have heard so much of lately, thus enabling us to continue horticultural work in the new fields under contemplation. I hope the committee will endeavor in the next report to give us a little more (in round figures) of fruit statistics for their districts.

A prominent member of our society has spoken to me of the advisability of this society's undertaking a preparation and publication of a history of Ohio Horticulture. It would seem advisable that something of this kind be undertaken while we have with us those gentlemen who could give from experience something of this nature. It is an undertaking that could not be expected to pay financially, so it must be backed by such an organization as ours. There are two ways that seem to me open for the accomplishment of such an undertaking. The first and most difficult would be the securing of an appropriation from the legislature sufficient to do the work and put it in the hands of competent parties to execute.

The second, and to me the most practical, would be to ask our Campbell, Ohmer, Harrison, Albaugh, Livingston and others to prepare memoirs on the subject, have them edited by our Secretary and published as a supplement to our report. It might be well to ask the local societies to take this matter up during the coming year and furnish such papers for publication as contained horticultural facts worthy of preservation.

I will not take more time upon this subject, but leave it with you for your consideration. In accordance with the action taken at the State Fair meeting, I appointed a committee on printing report. They have had a session and will present their action to the society.

It is a matter of considerable regret that our report was so late last season. However, it is a matter of some satisfaction to know it was not the fault of this society or any of its officers. The preparing of a programme for the annual meeting of this society is becoming more and more difficult as the years go by. The ground has been pretty thoroughly gone over. This task has always been largely performed by the Secretary. I believe the time has come when the Executive Committee should hold a meeting especially for elaborating the programme as far as possible, leaving it to the Secretary to fill in and complete. This would, could and should be done as far ahead as the time of our State Fair. By starting the programme so far in advance of the meeting, would make it possible to evolve new ideas, that under the present method are nearly impossible. By calling your attention to this method of arranging our programme, I do not cast any reflection on the arduous and excellent work performed by our Secretary, but on the contrary to assist and lighten his work in this particular, and if the adage is true that "two heads are better than one," let us see if five heads will not count proportionately.

In what I have said, I have endeavored to call your attention only to features of particular interest to us as an organization, seeking to take advanced ground. I hope to always be interested in seeing this society benefit the cause and the people for whom it is organized. After the excellent reports of our ad interim committee, it is superfluous for me to add more. Especially is this true when our proceedings will be crowded with so much valuable matter. The papers read here will contain food for thought and should receive your attention and consideration. It is to be hoped that whatever discussions take place upon any of the subjects presented, will be concise and to the end that we may disseminate the best practice of our profession.

I thank you for your courtesy and attention.

Mr. Woodard: I believe it is always customary for the President's message to be acted upon. I therefore move that a committee of three be appointed by the society to take into consideration the recommendation given in the address and that the committee report not later than Friday next.

On being seconded by Professor Selby, the motion was carried unanimously.

The President: The next number on the programme is "Fruit Notes for the Year," by Professor Greene, of Wooster.

FRUIT NOTES FOR THE YEAR.

By W. J. GREEN.

The past season has been remarkable for its abundance of fruits of nearly all kinds. Not only have the crops been good, but uncommonly fine. Fruit growers have had all that they desire this year, except those who are sordid enough to wish to make money out of fruit growing. There is a great deal of comfort in philosophy. It is a pleasure to know that the grapes which hang high are sour. The fruit grower may console himself with the thought that everything is low in price, and that things would be out of proportion if fruit brought a high price.

There is some consolation in this thought, if it were not for labor bills and freight, and if commission men did not have such provoking ways of making out returns, regardless of your feelings. Then too it would be much pleasanter if dealers and consumers did not get such cranky notions regarding quality when fruit is cheap. It is hard to account for that element in human nature which will cause a person to haggle over apples at 20 cents a bushel, insisting upon nothing but the very best, when he thinks he is getting a bargain if the price is ten times as high and not more than half of them are specked! It is indeed a hard lot for the fruit grower if he has neither cash nor consolation. He may take comfort in the thought that it is possible to do better in the future, and this he must strive to do or each season will find him a little worse off than the one before.

It is not possible to analyze the situation in a manner that all will agree as to the causes of financial depression. If we could do that, it might be well to commence back there, provided, of course, there were some hopes of a remedy. We might discuss freight rates, prices of labor and the peculiar ways of commission men, but for the same reason, the lack of a remedy. I have the past season, seen growers losing money, or barely coming out even, because of the excessive express and freight rates, when other growers, less than 100 miles distant, were doing well selling in local markets and saving all charges. I have seen fruit rotting on the trees, and in heaps on the ground when thousands of people not fifty miles away wanted it at paying prices. In many towns in Ohio the people did not get all of the peaches that they wanted because it cost more to send them from the peach sections than the price which the growers asked. But as a noted person once said of the tariff, "it is a local issue." This question of how to reach the consumer is very largely a local issue also. There is a general question, however, which seems to me to be of greater importance than all others. It is, "How can we grow none but first-class fruit?" Solve that and you have cut the Gordian knot, for the present, at least. The time may come when first-class fruit will not pay transportation charges, but it is not here yet, and there need be no worry as to how soon it will be here, provided the second and third class fruit is not allowed to knock the bottom out of the markets, so that all will drop through together. According to my information that came very near to being the condition of affairs last season. It was the cull fruit that broke the market, and the same kind of stuff that kept prices down. A grower said to me, "It is competition that is beating us, there is too much fruit grown." I agreed to this but pointed out the fact that it was competition in quality, not in quantity, and that the grow-

ers were mostly competing with themselves; that is, each grower sent his poor fruit as well as his good to market. The illustration was taken from the fruit on the street here in Athens, and I hope that no one will take it as personal, for I do not know the grower, and if I did it would make no difference, even if his name were given, for he could justly claim that he was not the only sinner. A load of peaches had been run through the grader, and were ready for the market. Not more than 25 per cent. were first-class, and about as many were of the D grade. The latter would probably not more than pay transportation charges, and it is doubtful if the next grade would return any profit. Here was competition of the worst kind. Such competition is far more destructive than that of good fruit against good fruit. It is poor fruit that sets the price, and it is poor fruit that disgusts consumers. Even if the price of different grades were arranged strictly according to quality, the low grade fruit would hurt the market. People will consume more bushels of good fruit than they will of poor. They are pleased when they get a good article, and buy more, but they feel cheated and disgusted when they try to use the poor, and often it prevents them buying a better grade, for fear of being cheated again. It is the same as with Georgia watermelons. We buy one and the stale, insipid thing so disgusts us that we resolve to wait until home melons come, but frequently we get bold and try another, and this so inspires us with caution that we lose half the melon season before we dare risk another. I looked over load after load of peaches in two prominent peach sections and it was exceptional to see a load of first-class fruit. Sometimes there were two grades, the poorer being left at home, but in most cases all grades were sent to market, either graded or mixed. All with whom I talked agreed that it did not pay to send the low grades to market, but the point at which I am aiming is that it does not pay to grow such fruit. The time has come when if one is not going to grow first-class fruit he would better be out of the business.

It is not my object now to tell how to do it, but simply to point out the fact that as a rule it is not done. Athens county might have sent away just as many bushels of peaches, with half the number of peach stones in them, and the number of dollars returned would have been in an inverse ratio to the number of stones. Consumers have found that it does not pay to buy peach stones, and when the grower comes to realize that it does not pay to grow them, then there will be less growling about competition, and other things which we cannot control.

A large peach grower bought a grader and was working it at the time of my first visit. Later in the season he was asked why he was not using it, and he replied that the peaches got to ripening so fast that all hands had to get out into the orchard and go to work. His trees had received good care and the grader was not an urgent necessity, and had thinning been practiced, it would not have been needed at all. The possession of a grader may be considered by some as the mark of a progressive peach grower, but it seems to me that he is still more progressive who grades his peaches on the trees, even commencing before the buds are open in the spring.

My observations during the season lead me to believe that the greatest enemy of peach growers is not the yellows, nor borers, nor rot, nor frost. There is a parasite worse than all these and the railroads put together. It is a worse "bugger" than the commission men, even. It is a vegetable parasite, although not a fungus. It saps the vitality of the trees; it breaks them down; it breaks the markets down, and will break the growers up, if they allow it to flourish. This parasite is the little cull peach. He may be a benefactor who makes two blades of grass grow where one grew before, but in peach culture the wise man will seek to double the size instead of the number.

Last year at Canton I pointed out the fact that the apple scab fungus had received a check, and that we might expect a crop of fair apples, even without spraying with fungicides. So far as the scab is concerned this prediction has been ful-

filled, but something unexpected has happened. There is another fungus which gives a blackened, sooty or smutty appearance to apples, that has been very prevalent this season. Commonly it is seen on apples grown in valleys, or on low, level lands. In hilly sections it is seldom seen near the tops of the hills, and not infrequently the apples on the lower branches will be affected, having the appearance of being smoked, while those on the top of the trees will be free from it and highly colored. This season it appears to be everywhere, even the topmost apples on trees growing on hilltops, are affected. This is owing to continued wet weather, of course. The harm that it does is considerable, as it prevents coloration of red sorts, and gives a dirty appearance to all. The Rome beauty is very subject to it, and this fact has had much to do in restricting this variety to the hilltops. Bordeaux mixture is a sure remedy, and experience with it the past season at the station was satisfactory and convincing. It was my opinion that it would not pay to spray apples this season, for fungi, but it did. Spraying apples may not always pay, but it should be regarded as a form of insurance, which it is good business policy to carry.

The low prices which apples have brought this season must convince every one that there is an overproduction, but the trouble is not merely because there have been too many bushels, but because there have been so few really first-class market apples. The majority of those offered are not wanted, and it is the same as with peaches, those which people do not want must be sold cheaply, and this governs the price of all.

There is nothing in the present condition of affairs that need discourage apple growers. Heavy crops over such wide areas are not likely to be produced very often. The thing which most concerns apple growers in Ohio is how to produce good crops of marketable apples, such as will stand a fair chance in competition with western fruit. We have some good winter varieties, but before the apple grower in Ohio can feel well equipped to enter the markets against western apples, he must have something that will meet the market requirements, as well as the large showy varieties from Missouri and other famous apple sections. We must admit that we have no varieties that quite come up to the requirements, and very few that come anywhere near the mark. It is the history of horticulture everywhere that when a variety is wanted for a special purpose, in a particular section, it is forthcoming. We may not be able to produce, at will, such varieties as we desire, but if we were to go back to the good old practice of growing seedlings, for the purpose of getting improved varieties, we should soon find what we need. We have kept on improving small fruits, and indeed most other fruits except the apple, but with this, the king of fruits, we have made but little progress within a generation. Within that period varieties have been found that are suited to the northwest, and to the southwest, and they are constantly making accessions to the lists in these and other sections, but we are standing almost still. If anyone thinks that the same varieties and the same methods which made apple culture successful twenty years ago will answer to-day, he will surely find his mistake in practice.

For a number of years I have given reports of the behavior of varieties of fruits at the experiment station. There are some pleasant and profitable things about variety testing and some that are quite the reverse. Passing over all other considerations, the matter which disturbs me the most is the contrariness of some varieties. They have a way of going and doing just the other thing from what you said they would. If a variety behaves one way in one place, and quite differently in another locality, we can overlook such actions, for such things are not unexpected, but when a new sort seems to have settled down to a certain course of action and you begin to think that you have become acquainted with it, and you tell other people of its good or bad habits, then to have it get cranky and do some unexpected thing, right before your eyes, makes one wish that he had never talked about it.

I have seen so much of the capriciousness of certain varieties, that I have become very skeptical regarding the truth of the well worn saying that "varieties vary according to the soil." They do vary, that is a fact, but they do not vary according to the soil nor according to anything else that I can find out. What it is that causes them to vary is a mystery. Treatment, soil, climate and perhaps other factors may cause variation, but to attribute it mostly or altogether to the soil, is absurd to anyone who has given the matter careful attention. It has been said that the soil theory of variation was invented by nurserymen, as a convenient hole to crawl out of.

Some one reports that a variety has failed with him. Interested parties at once say it is because it is not adapted to his soil, and cite the fact that it does well in other localities, but the important fact how long it has done well, is omitted. Some varieties are excellent when they are petted and coaxed, when the season, soil and treatment is just to their liking, or as we commonly phrase it, they need good care and cultivation. There are men who are unwilling to begin work without the best of tools; the weather, rations and everything must be just right, and when these are adjusted to suit they work willingly for a time but soon get tired. It was that tired streak in them that made them so exacting. The test of time brought out their weakness. So with these fickle capricious varieties. You think that you have adjusted things to their liking, but all at once they seem to get tired, and then in a year or two they may take another spurt and astonish you again. I firmly believe that there is a tendency in every variety in cultivation to vary. Stability is a thing unknown among plants, especially cultivated plants, where frequent crosses have intermingled tendencies of various sorts. Instability is the rule, not the exception.

We must, however, recognize the fact that varieties differ in the degree, or amount in which they vary, and in their susceptibility to outward influences. Let us contrast Crescent, Warfield and Haverland with Jessie, Sharpless and Timbreil. We find a marked difference in the reliability of the varieties in the two lists. In a dozen different states, on a great variety of soils, and in diverse climates, those in the first list are to be relied upon, year after year, while those in the other lists are as fickle as coquettes. Sometimes they smile and sometimes they pout, and no one can tell in what mood he will find them next.

Miss Jessie was a charming debutante as I ever saw, and beside her the old reliables were commonplace. I felt like giving her the highest rank and said as much. Perhaps too much praise spoiled her, for she became so indifferent regarding her behavior as to be put on the list of rejected. After several seasons of indolence she roused herself again, but her prestige was gone, for we had learned her ways. Occasionally we hear of some one who thinks that he has rediscovered a prize in the Jessie, but the universal experience is that she is fickle.

The Timbreil was two years in getting used to western ways, and during that time was nothing but a laughing stock, but the third season it took on a color and a polish that put to shame the catalogue pictures.

Such experiences are common, and given the time, it would be possible to classify many of the varieties of all kinds of plants into reliable and unreliable. Some would fall very naturally into one or the other of these classes, while others would be arranged with difficulty, and we could not always draw the dividing line. These vacillating sorts are a burden to the experimenter with varieties. Until he learns what they are he is liable to praise or condemn one year, and reverse his judgment the next, and to confess that he knows nothing about them the third season. Then, too, his opinion is liable to conflict with those whose judgments are not to be despised. In practice these sorts soon drop out, or are heard of occasionally, here and there for a time, and then disappear altogether. They would disappear sooner if it were not for the fact that so many believe that it is possible to find a variety which just suits their soil, even though it does well nowhere else. This is the will-o'-the-wisp that keeps unreliable kinds in existence beyond their time. I have en-

tered upon this discussion somewhat fully for the reason that I feel an unwillingness to continue reporting on varieties without making a declaration of principles and belief.

I do not think a single trial is worth very much of itself in determining the value of a variety. Each report is but an item of evidence and it needs a great number of such items, not only from different places, but in different seasons. An unfavorable report really counts for more than one of the opposite kind, for if a variety has a weakness, it is liable to manifest itself even when the conditions are thought to be favorable. In fact the sifting out process is really the most important part of variety testing, although a great deal may, and ought to be said concerning characteristics, and comparisons made whenever possible. I always make a report on varieties reluctantly, for it is not pleasant to think of the possibility of having to take back what one has said and of misleading others, but these things seem to be unavoidable. The following remarks on some of the newer varieties are offered simply as evidence, which if taken along with evidence from other sources, combined with personal experience, may afford those who are interested the means of determining which are safe to plant and which not:

STRAWBERRIES.

It is hardly worth while to talk about the Marshall, Timbrell, Brandywine and Brunette, so far as reference to market qualities is concerned. The last two have some value for market, as they are pollen bearing sorts and yield fairly well. The Brandywine, at its best, is a fine late sort, but it does not always do its best. It would be a pity if the Marshall were dropped because it produces sparingly, as for home use it hardly has an equal. Its large size, quality and beauty all combine to make it almost perfection for the amateur. The Brunette is its equal, except in size. Possibly some one has customers who will pay him 15 or 20 cents per quart for berries, and if so he may find these sorts profitable, but they ought to have a place in every home garden, at any rate.

CARRIE. This appears to me to be an improvement upon the Haverland, in color and firmness, otherwise the two are much the same. Should it sustain itself it will be an acquisition.

MARY, H. W. BEECHER and ELEANOR have not, thus far, shown any remarkable traits. The best specimens of the Mary are large and beautiful, but do not average large. Irregularity and unevenness, seem to be the faults which are the most prominent in this variety. We regard this as the best of the three.

TENNESSEE PROLIFIC. For near market this is one of the best of the perfect flowering sorts. It seems not to have been planted very extensively in this state, but it is worth trying as a pollenizer. It is a good mate for the Greenville.

WM. BELT. This is very nearly equal to the Marshall in size, and about twice as prolific. I have recommended it unreservedly, but during the latter part of this season the plants have rusted quite badly, which seems unfortunate, as otherwise it appears to stand about at the head of perfect flowering sorts. It sometimes happens, as in the case of the Beder Wood, that the plants are able to mature a crop in spite of the rust, and it is to be hoped that this will be true in the case of the Belt, for it is too good a variety to lose.

BISEL. This is not a large berry but it is uniform in size, and holds up so well in size to the last of the season, that it appears to have more than ordinary merit.

MARGARET. I have not seen a more beautiful berry than this, but have some doubt if it is sufficiently prolific for commercial purposes. If this can be assured it is an acquisition.

STAPLES. Very prolific and firm; fully equal to the Warfield in these particulars, but smaller. With us it has not averaged an inch in diameter, not more than

three-fourths of the berries being of marketable size. If it can be grown to a fair average size, it surely is an acquisition.

PORTAGE. This variety, which is to be introduced soon, has considerable merit. It belongs to the Sharpless class, but seems to be more prolific, and does not have the green tips of that variety. Its ability to endure frost remains to be tested.

RASPBERRIES.

LOUDON. The fact that this variety is rather slow in growth, requiring more time to become established than some, makes it somewhat difficult to determine its relative value. The fact that it is slow in coming into full bearing may not detract from its value as we have some good varieties of this class. In size and color the fruit is unobjectionable.

MILLER. This too is somewhat lacking in vigor, but rather excels the Loudon in this particular. It seems to be promising, but more time is needed before judgment can be passed upon it.

KING. So far this is the most promising of the newer red sorts. The plants are quite vigorous and prolific; the berries are large and firm. It is quite early in ripening, although not as early as the Thompson.

COLUMBIAN. This really does appear to be an improvement upon the Shaffer, but appearances indicate that it, too, must give way to a new variety of Ohio origin. This variety comes from Portage county, and it must be admitted that a comparison has not been made, but judging from the growth on the originator's grounds, and at the Station, it excels all others in this particular, nor is there any reason to doubt its prolificacy. The fruit is rather lighter in color than the Shaffer, and firmer. I shall not be surprised if it excels all others of this class.

EUREKA. Considerable fault has been found with this variety, because the plants are small and do not start vigorously, causing vacancies in the rows. It is said also that old plantations of this variety deteriorate rapidly. These objections may be well founded, but I have not been able to investigate them. Our plants yielded a fine crop last season, but the young canes are seriously affected by anthracnose, as no spraying was done because the disease had shown itself but little for several seasons. It has attacked this variety so much worse than others that the plants have made the poorest growth of any in the field. The same thing has been noticed with other varieties in previous seasons, hence it is hardly safe to assert that the Eureka is particularly subject to the disease. The Palmer and Gregg are usually thought to be quite subject to the disease, but they are now comparatively free from it. It may be that when the conditions are just right for the growth of the fungus that the variety will be attacked which happens to be at the proper stage of growth to receive and nourish it. In other words, when conditions of growth on the part of the fungus, and inception on the part of the raspberry plants coincide, then the disease gains a foothold. It may be interesting to those who believe that Eureka and Mohler are distinct that the two became infected at the same time and with equal severity.

LOTTA. I can do no more than to repeat the good report given last season of this variety. It was thought to ripen at about the same season as the Gregg, but it is probably several days earlier, and there is still a place for the Gregg.

GAULT. This variety must finally be rated according to its ability to produce a crop in the regular season. It will do this, but as compared with Lotta and Gregg, it is rather weak in growth and will not produce equal to either one, nor is the fruit as large. As an everbearing sort, it is superior to any other now known.

BLACKBERRIES.

There is nothing new to note concerning this fruit. The Eldorado stands easily at the head of hardy kinds, but there seems to have been a strange oversight in not

bringing the Early King more prominently before the public. It came from New Jersey, where extreme hardness is not a necessity, which may account for the fact that hardness as well as earliness was not made prominent. It is not quite as hardy as Snyder, but it seldom winter kills. Its virtue is found in its earliness, being nearly as early as Early Harvest and about as large as Snyder. It seems to be almost unknown among Ohio fruit growers, but it will fill a place not at present occupied.

PLUMS.

It is still a question regarding the value of the Japanese plums. It is easy enough to find words of praise for some of them, for they are deserving, but when we stop and think and ask ourselves what good things can we say of the best of them which we cannot just as truthfully say of a number of European sorts, we are puzzled. It must be admitted that they do not fill a place not already well filled before. The Burbank is an early and prolific bearer; the fruit is large, beautiful and of good quality. Seemingly this is enough to ask of any plum. It rots on the tree, but not much worse than many other varieties. The trouble comes in handling it. It does not color fully until quite ripe, and begins to rot at once. If it would color after picking, or color earlier, not much fault could be found with it, but my present knowledge of the Burbank would prevent me planting it largely.

ABUNDANCE and BAILEY have less of this fault, and are better in quality.

EXCELSIOR is credited to this class, but has the appearance of a native. It begins to bear young and is wonderfully prolific, but in quality is hardly equal to Wild Goose or Pottawatamie.

It seems to me that we are in danger of overlooking the value of the native varieties. It is true that they are lacking in quality, as a rule, but their reliability commends them. If I had not seen several instances where they were grown for market profitably, yielding crops every year, where other kinds were grown with difficulty, I might be less favorably inclined towards them. Such sorts as American Eagle, Wolf, Louisa, Hawkeye, Forest Rose, Wild Goose and others that can be named will sell readily, in almost any market. The fact that most of the natives have been propagated by budding on peach stocks, has worked to their detriment. In ordering plum trees for the Station, I always stipulate that they shall be on plum roots, but do not always get them.

At the rate which our plum and apricot trees at the Station, budded on peach stocks, are breaking off and dying, not half will be left when they are five years old. The fact that the trees appear to be short lived and some of the varieties being of poor quality, has created a prejudice against the natives as a class. I venture the opinion that in the near future we will find that there is more profit in our native varieties than in the Japan sorts, but the European varieties will take the lead, where they can be grown successfully.

PEACHES.

As our peach trees have not all come into bearing, I can offer remarks on but few varieties.

CROSBY. Everyone is asking about the Crosby, and if indications are to be trusted, everyone is going to plant it. This is mainly because the impression is abroad that it is almost ironclad. We find, at the Station, that when other kinds get killed by the cold, the Crosby does also. It is more hardy than Crawford, but will not endure more cold than Hill's Chili, Smock and Heath Cling. It has some good qualities, which make it valuable for home use, but it is not the ideal market peach. Sometimes it attains a fair size, but this is the exception.

CHAMPION. This too, has been rated as extra hardy, and it has endured the winter a trifle better than Crosby with us. It has been called an early peach but it

appears to be medium in time of ripening. It comes at nearly the same time as the Old Mixon, and not being so highly colored, it is difficult to see how it will compete.

NEW PROLIFIC. This is about a week ahead of the Elberta, but is hardly the equal of that famous variety, being rather smaller and not as highly colored. It is, however, a beautiful peach, of good quality and comparatively hardy.

Mr. Albaugh: I was particularly struck with the Professor's theories upon the variations of fruits, and there is lots of truth and some poetry in that. Some twenty odd years ago, from the planting of a large yellow flesh cling peach originated the kind now budded and planted in orchards almost all over the country, known as the Hill Home Chief. It was an improvement on the Stump in flavor, and an improvement in size and color upon the old Mixon's free. Some eight or ten years ago, a variety that has been controlled practically by us, one originating here in this county, a large, fine flavor and fine appearing semi-cling peach, with yellow flesh,—two seeds from the original fruit taken from the tree in this county, were planted by the good wife, (after having been bedded in an old tin can and put away in the cellar during the winter) in my garden, and this year I exhibited peaches at the State fair from this tree, a seedling of this Diamond peach and it was nearly as large as the original. This was entirely a free-stone, showing the variations in the seeds from one fruit to another. It is a well known fact that different varieties of corn get mixed, although the different varieties may be 100 yards apart. I do not know how much variation there may be in the bulbs and flowers that the Professor spoke so carefully and so inexhaustively upon. But speaking about variation, and remembering that the original peach was, as a South Water street commission man said to me in New York, in regard to the Michigan peaches marketed there in 1895, that he "didn't see how in thunder they succeeded in stretching the skin over the seeds."

You all know about the original apple (not speaking of Adam's apple, which has been a trouble a great many years) that was found in the thickets of this state and others. It was a little, puckery, sour, bitter crabapple, and from that all the varieties that we have originated. And so from the little choke pears, that were hardly ripe until they were rotten, and that put every boy's mouth in shape to whistle Yankee Doodle, that have been carried on by evolution, we have the Bartletts, the Flemish Beauty and other pears. But we must remember that in the cultivation of plants, as well as in the breeding of animals, there is a constant tendency to deterioration back to the old original type.

Professor Lazenby: I was particularly interested in Professor Green's discussion of the tendency to variation, the instability of varieties, and this thought has occurred to me, that we sometimes think it is wonderfully marvelous that varieties should vary; but it seems to me more marvelous that there is so much similarity, and yet we lose sight of

that side of the question. Just think of what wonderful stability, after all, there is in a large number of our varieties, when we consider the wonderful differences under which they are grown. It is over one hundred years ago that the Connecticut apples were first brought to Ohio at Marietta and some of them were quite old varieties then, and quite a large number of the varieties first brought are still cultivated, and are just as distinct to-day, and preserve their individual characteristics, as when first originated. And when I think about it, sometimes I think there is more wonder in the fact that we have so much similarity than there is in the fact of the strong tendency to variation.

Mr. Frank Ford: This paper of Professor Green has been very interesting to me, indeed. It is a subject that I have spent a deal of thought and study and time upon, and I wish to make this declaration that, with the exception of one little seed, of any variety of vegetable, or perhaps of any variety of fruit, there is no such a thing as absolutely pure seed. That is, you cannot depend upon one seed being like that planted. Now, that may seem strange, but I believe it is an absolute fact, and it is only by the most careful selection of seed, and keeping them isolated from other varieties that the seed can be kept pure. And that means a great deal, for the little busy bee puts in his work when you don't expect it. A man plants beets of one variety, and he is a most careful grower, and he expects that they will produce beets as nearly as possible of the same variety. But growers are too ready to blame seed men if they get beets of another color.

And another thing: The man that sells the seed is not the grower. You cannot grow a variety of beet seed and insure its purity, unless you can put a canvas over it and keep the bees away. It is only by the most rigid selection that you can get it anywhere near pure. Take sweet corn or field corn. Who ever saw, in any piece of corn that ever grew, perfectly pure seed? You may have bought the purest seed you could buy, but who ever saw a basket of corn out of which he could not pick a half dozen varieties. It is impossible to have it any other way.

There is another point. I see some beautiful parsnips here, and these were grown from a little root about as big as your little finger, and in five years, or in three years' time if they were left in the ground and the seed allowed to fall to the ground, you would have nothing but that little root left again.

There is a great deal of complaint about cabbage variations. Now, it is a positive fact that if you take some seed and sow it at one time and in a certain manner, when you get your crop you will get something very unlike what you expected. You take the same seed and sow it at another time and you will get just what you expected. Why is this? Cabbage is one of the most peculiar things to grow there is if it is checked in its growth. You sow the seed early and you are not ready to transplant yet, the plants become checked in growth and then you start them into grow-

ing and you produce a variation that will carry it through the crop to the very end.

Now, in regard to strawberries, they vary so much on different soils that I always tell my friends never to depend on any description that anybody gives in strawberries. Only try it yourself and see what it will do. A man will produce or grow several varieties of plants, and he will find one among them that seems on his soil to be perfect; grows larger and produces more, but he sends it out to the public and the treatment is different and the soil and conditions are different, and the season is different perhaps the first two or three years, and, as Professor Green says, they are "fickle," and he cannot tell anything about it.

Secretary Farnsworth: I wish to say I find that the Anthracnose appears and disappears on any variety regardless of any apparent cause.

A few years since a raspberry grower near me complained that his Hilborns were badly injured by Anthracnose, while his Greggs were free from it. On my own grounds the case was exactly the reverse. Two or three years later his Hilborns recovered and the Greggs were attacked, and on my place my Greggs recovered and Hilborns were so badly damaged that I did not give them their usual spring hoeing, intending to mow them off in August. By midsummer, however, they had recovered and were luxuriant, and were very productive for several years.

The Eureka does not make a large plant, but the best stands I have ever secured were from this variety. The bush is not tall, but stocky and self-supporting and capable of carrying enormous loads of fruit. I have seen plantations twelve and fifteen years old in good bearing condition, with only ordinary care.

The King raspberry gave us a few ripe berries June 7th, while our first blacks, Palmers and Eurekas were picked June 15th. Loudon has been very productive with me.

The President: I want to call upon Dr. Aldrich, who is obliged to go away to-morrow morning and cannot be with us after this evening, and he has made some experiments with Wild Goose plum culture this summer, that we would like to have him talk to us about.

Dr. Aldrich: Mr. President and Gentlemen of the Horticultural Society: It is perhaps not so much upon the culture of the Wild Goose plum that I will speak. I realize that it is getting late and I will endeavor to make my remarks as brief as I can, and at the same time what I have to say may be of some interest to you in testing some of the newer varieties of fruits of the various kinds.

I will not attempt to give you anything of a history, such as an *ad interim* report of the general character of fruit or fruit raising in my locality, but will confine myself to some of the newer varieties on my grounds, and will commence with the currant. I have probably eight or ten varieties of the currant and of these I find the Wilder to be the most desirable. I have tried the Fay, the Prince Albert and quite a

number of others, and I consider the Wilder the most promising in size and productiveness that I have on the ground.

Of gooseberries, the Champion, set out six or eight years ago, I think to be a very desirable variety, and I think it is generally larger than the Houghton. Ever since the first year it was set out, it has been exceedingly productive, fully as productive as the Houghton and more productive than the Downing. I have another variety which is only about the size of the Houghton and fully as productive, called the Utah. It was sent out probably eight or ten years ago by John Saul.

Passing from this to the subject of cherries: At the time when Professor Budd, of the Iowa Agricultural College, made his importations from Europe, as soon as he announced through the bulletins of the college that he had propagated several varieties, I sent to him and secured direct from him, something like twenty varieties of the European cherry, the North German and Russian varieties. This is the first year that they have come into general bearing. I have some varieties that have borne for two or three years, but this year nearly every variety I have, bore, and I have something like fifty or sixty; and while I realize that a single season by no means establishes the value of a variety, yet you can form a comparison between these and others, similar to them. I find in this list two or three general classes. There would be one class that is very similar to our Kentish cherry, the early Richmond, the common Red, as it is called in New York and Michigan, and the Nelson Kentish, and the only difference I can see between them is the heavier foliage that seems not to be quite so subject to the fungus, and in some years seems to protect the blossoms from the frost. Of those varieties, one which has the heaviest foliage and which last year produced in my orchard for the first time, bearing when the Early Richmond did not bear, on account of the frost, is the Sklanka. The fruit in size, color of juice and time of ripening, very much resembles the Early Richmond, but as I say, the foliage was very much heavier. It seems to be a little more compact in growth, and bore last year when the frost killed the blossoms on the Early Richmond. Of that class I would consider among the most promising the Early Morello, from Orel, Russia. It has many of the Kentish qualities and is somewhat like the Sklanka. It more nearly resembles the Early Richmond or Nelson's Kentish than it does the Sklanka, on account of its more straggling growth.

Another variety that seems to be a little larger and may come into bearing a little earlier, is what is called the King's Morello. It is a white flesh and white juice variety, and seemingly a little larger than the Early Richmond. It commenced to bear when it had been planted only two or three years, and being a little larger than the Early Richmond, may have value.

Another class is a dwarf kind of tree. I do not know that they should be called Russian. I think they are more properly German

They are very similar to the variety in this country called the Wragg. The trees have been out five or six years, are hardy in bud and stand the late frosts well. They have borne full crops for the last two or three years, in fact, when they were not more than two or three years old. The Ostheim trees seem to be a little larger than these.

Question: Is the Wragg a black cherry?

Mr. Aldrich: It is very similar to the English Morello. It is a different shaped tree, starting right out from the ground, and when it is six years old not higher than one's head. I have had two or three varieties, one of a larger growth and probably a little better variety, called by Professor Budd, *Cerise de Ostheim*. It is a distinct variety from the other Ostheims, being considerably larger, fully as large as the largest English Morello, about the size of the May Duke, and it is fairly productive, but not by any means as productive as the Kentish class that I have spoken of.

Then there is another variety that is properly called the Morello. I have two, one called the Late Morello and the other the Shadow Morello. There is not much difference between them. They are productive and quite hardy, but the fruit is not large. They have a dark colored juice.

There is another variety that seems to be the hardiest of anything I have. It is called the Lithauer Weichsel, and is somewhat larger in tree, but with smaller fruit than those I have mentioned. The fruit until it is fully ripe has a bitter taste, but when fully ripe is rich and very good canned. It has borne every year for about four years, while I cannot say that of any other variety I have. There are also among these cherries a number of varieties that might be called of the Duke class. Among them is Hertzog's May. Of course all German scholars know what is May Duke, and it is quite similar to May Duke, although I think there is a difference. It ripens a little later, and is just a little larger than the May Duke. It bore better this year than the May Duke, and is fully as good in quality.

There were also some of the sweet varieties, but I find they have the same fault; they are a little late in coming to bearing. The Vilna sweet was not large. They were about as large as the Windsor the first year of their bearing on my grounds. The tree is very vigorous in growth and seemingly healthy and hardy. There is one other called Amarelle Burt which means beautiful Morello. They are a sweet cherry, and more like the Mazzard than the Morello. They are the most vigorous growers I have, but they have not borne except a few specimens.

There is another that I will mention. It bore this year for the first time, called Lutokva. That seems to be a Russian variety, and distinct from anything that I have seen. It bears rather young; is as large as a good-sized Duke, and is of a yellow cast. The trees seem so

far to have been perfectly hardy and fairly productive, bearing quite a quantity of fruit for the size of the trees. I shall look to them with interest in the future.

Speaking of plums, I want to corroborate what Professor Green said of the value of our native varieties. The abundance all rotted on two quite large trees. Of the Burbank, of which Mr. Green spoke, I have a tree that is about four years old. It set so full that I pulled off more than half of them, but I needn't have pulled off any, because before they were grown they were all rotten. The other American varieties also rotted badly this year, although two or three of them produced some fruit. Another variety, Poole's Pride, is one of the very best in quality; but they rotted badly and we got but few from them.

It seems that while the American plums are not exempt from rot, they are not so subject to it as the Japanese or European varieties in our locality. In my neighborhood the rot was unusually bad.

I fruited the Diamond peach for the first time this year, but of course, being on a young tree, we would not expect the samples to be as fine as those at the State Fair from older trees, but they were good size, and rotted as little as any during that period. Of the Diamond I think that three-fourths ripened and not more than one-fourth rotted on the tree.

Professor Green: We had a Suda Hardy tree, and I could not tell it from the Wragg.

Dr. Aldrich: I have them growing about fifteen feet apart, and there is very little difference, if any. The fruit we cannot tell apart. It seems to me there might be a little difference in the style of growth—not quite so compact in growth.

Professor Green: They are of a distinct origin.

Mr. Albaugh: How do you think a nurseryman is going to get his money out of Wragg trees for market if he grows them to the standard size of five or six feet in height?

Dr. Aldrich: I would say that I bought mine about eighteen inches high and considerably smaller than my little finger.

Mr. Albaugh: We tried the Wragg, getting the buds from John Wragg in Iowa, and we were not able to get enough trees to market to pay Mr. Wragg for the buds.

Mr. Ohmer: We have a Wragg, and I don't believe it is good enough to warrant very much effort for it.

Mr. Albaugh: I might say that we put it in nursery rows and it didn't get big enough to make trees of saleable size. We let it stand there four or five years, and it didn't get big enough to sell, but it got big enough to bear cherries.

Dr. Aldrich : I fruited an unnamed variety of the Russian apricot this year for the first time. It bore a full crop of good quality, free from rot, and about the size of a very large Damson.

The President : Our programme has been lengthy and entertaining, but isn't it time to adjourn for this session?

Adjourned until 9 o'clock to-morrow morning.

MORNING SESSION.

THURSDAY, December 3.

The President called the Convention to order promptly at 9 o'clock Thursday morning, and announced that the first feature of the programme would be the discussion of the questions in the Question Box, whereupon the Secretary read the questions to the Society.

Question : Apple orchard 28 years old ; 15 per cent of the trees missing. Should they be replanted

Secretary Farnsworth : No.

Mr. Ohmer : My experience has been that whenever you replant a dead tree in an orchard, although large, that tree does not get the attention it should have, and in the long run it amounts to nothing.

Question : Would it be advisable to dig around the roots of peach trees to take out the grubs in the fall of the year, or would it be a damage to the trees? To be answered by the President.

The President : There are others here who have had much more experience than I, who can answer that question, but I never saw any ill effects from taking the grubs out of the trees in the fall, and I have practiced it on a good many trees.

Mr. Albaugh : We are taking the grubs out of several hundred thousand of trees now. We now have about one hundred black fellows on their black stomachs digging out the grubs from the trees in Georgia.

Mr. Miller : Do you do it twice a year or only in the fall?

Mr. Albaugh : We do it in the fall ; in November, each year.

Mr. Miller : It is the practice to dig them out in the fall, but a good many go over them a second time in the spring.

Mr. Ohmer : That is a good practice.

Question : While money is the most profitable thing in the country to deal in, what inducement is there for anybody to put money into any kind of business ; and how shall the horticulturist get a market for his product if business is dead and men idle and working for low wages?

Professor Lazenby : I think that question was partially answered by Professor Green last evening. A great many will find a market, at least if they have nothing but first-class products.

Question : What effect, if any, will planting pumpkins among water-melons have on the size and quality of the melons ?

Mr. Whitney : I can tell a good deal about the quality. They will be good for nothing. At one time I had pumpkin vines come up among my watermelons, and the watermelons for some distance away were utterly worthless.

The Secretary : We have had that experience also.

Mr. Rockhill : I plead guilty to asking that question. I am a water-melon fiend. I raised watermelons in New Jersey, and sold watermelons in Canton for three years ; brought car-loads of them from Indiana, and I regard the Indiana melon just as good as the New Jersey melon. For the last five years I have been buying watermelons to eat, and last year bought some from the Indiana market much larger than ever before, but in quality they were but little superior to a pumpkin, and I got the notion into my head that some of the horticulturists were planting to get a good size, and I thought I would put the question to them.

Mr. Aultfather : It seems to me that the effect of planting them together the first season would not affect the melons, but the seeds taken from the melons would affect the crop the next year.

Mr. Whitney : It would affect the quality of the melons the first year.

Mr. L. B. Pierce : It has been repeatedly demonstrated that they will not hybridize. You can plant cucumbers and squashes together and they will not mix.

Mr. Livingston : I have serious doubts whether they will mix at all or not. I think the main cause is the soil in which they are planted. I know from my own experience that good strong sugar tree land will raise sweeter melons than any of your black elm tree land. We took some seed to Iowa in 1880. The first year they were fine. I said to our man who went on the street selling them : "There are some fine Cuban Queens, and I want to save the seed." But there was no sweet to them and, therefore, I saved no seed.

They were the most beautiful Cuban Queens I ever saw. The question I wanted to ask that gentleman over there (Mr. Whitney) was whether or not he did raise any watermelons if he didn't plant pumpkins among them ?

Mr. Whitney : I didn't plant any pumpkins at all. I said that the watermelons anywhere near the pumpkins were worthless and away from them they were as good as ever. Pumpkins growing near water-melons will ruin them.

Mr. Shirer : I planted pumpkins and cucumbers and nutmegs all together. The whole thing failed. Don't be too sure that there is nothing in it. A good many of the impossible things are beginning to be possible.

Professor Selby : I should be surprised if they would not pol-lenize.

Question: Which of our native forest trees are most suitable for roadside or avenue planting in Southern Ohio?

Mr. Ohmer: We planted in Ohmer park, where I live, various kinds of forest trees, and the handsomest trees we have there now are the elm. I cannot give you the name now, but it is quite a rank grower.

The Secretary: The common white elm makes a very beautiful tree. They grow fast and are very handsome.

Mr. Albaugh: The ordinary sugar maple is a good roadside tree in Southern Ohio.

The President: I saw both the maple and the elm growing over at the Insane Asylum this morning, and they seem to be doing very well there.

Mr. Livingston: In Broadway, in Columbus, are planted two rows of trees, leaving about sixty feet between the rows. They are planted in regular swampy land. I have gone over the ground on log bridges right through Broadway in the City of Columbus, and yet the elms are three times as large as the soft maples are to-day. I find the elm very much hardier than the maple.

Mr. Whitney: How about the Carolina poplar?

Professor Selby: If you are adding a tree to the American elm—it is certainly a beautiful tree—add something for a longer time than the maple, and it seems to me it is about time that we are beginning to plant for a good deal longer time. Our pin oak does so well that it deserves planting where the time is a little longer, although the growth is quite rapid.

Secretary Farnsworth: It has occurred to me that we may secure an immediate and a lasting effect by planting alternately the Carolina poplar and the Norway maple. The Carolina poplar is a very rapid grower, and while we are enjoying that, the slow-growing Norway maple gradually takes its place. It is a slow grower and crooked while young, but where people understand it there is nothing much finer when it obtains its size.

Professor Lazenby: I think the Linden or American bass-wood is a good thing for a road-side planting. We have quite a number of these on our grounds, and they have made a very rapid and symmetrical growth and I believe they are admired as much as any tree. I do not know that they would be adapted to all localities, probably not, but in some sections of the state bass-wood does very well.

Mr. Albaugh: I fully agree with the secretary in regard to the Norway maple being a good tree. The Carolina poplar is a very handsome tree, but as it gets older it looks more like the ordinary forest tree and does not make a very compact round head. My experience with the American linden or bass-wood has been good, in all kinds of soil, although we generally find it growing in damp soil in its native sections, but we find

it to do quite as well on soils with a gravelly subsoil. The leaf is broad and the tree withstands the winter very well. It attracts the bees and the honey-loving insects in the spring and makes one of the handsomest shades.

Mr. L. B. Pierce : One of the handsomest trees in this section is the Liquid Amber (?). It is a native of Kentucky, and I guess of this part of Ohio, and is very fine for streets in country towns where there are no sidewalks. It is one of the handsomest trees you can plant. It colors like maple in the fall, but where there are sidewalks it drops a liquid amber that makes it disagreeable.

Mr. Ohmer : It is a very handsome tree.

Question : How shall chrysanthemums be cared for in winter to have them in good condition for propagating plants ?

Mr. Ohmer : I will tell you what I did with mine. After they were done blooming I put them in a bed and let them stay there all winter, and I never fail to carry them over.

Mr. Whitney : Will it do to put them in the cellar ?

Mr. Ohmer : It is an easy matter to dig a hole in the ground and cover it with glass. The cellar is all dark usually. Mine is five feet deep and covered with a large sash.

Question : Are there any fertilizing properties in lime for the fruit growers ?

Professor Green : Yes ; lime is an essential, but it is found in almost all soils, so it is hardly necessary to put it on, as it is generally there. There may be some soils where lime is quite scarce. Ordinarily it would not need it.

Question : Would acid fertilizer have any good effect in destroying the chinch bug ?

Professor Webster : No.

Question : What is the best plan for maintaining the fertility of the soil while growing a young orchard on sloping or side-hill land ?

The Secretary : That is a pretty broad question.

Professor Taylor : My experience is that one of the chief difficulties in maintaining the fertility on side-hill land is the wash in winter. And anything that will prevent that winter wash will do a good deal towards maintaining the fertility. For that reason a covering crop, even those which do not of themselves add anything to the fertility of the soil, such as rye, is a good thing. Crimson clover is an almost ideal covering crop for an orchard, but in exposed situations it is quite doubtful whether it would stand in this climate.

Secretary Farnsworth : This is quite a hobby of mine. I do not think we give these crops quite as much credit as they deserve. We think they do not add very much fertility, but their value comes from the fact of shading the soil, promoting chemical action and preventing waste. In regard to crimson clover my experience has been that if I

can get a sufficient growth in the fall I have no trouble in wintering it. My cherry orchard is covered with a magnificent mat of crimson clover. I believe where our soil is of such a nature that we can be reasonably sure of securing moisture in July or August, we have hopes of succeeding with crimson clover. I am inclined to believe that where the soil heaves in winter, that sowing oats or buckwheat with crimson clover would be of an advantage. I am an enthusiastic advocate of cover crops, and if we can make a success with the crimson clover it is a panacea to the fruit grower. We can sow it in August, and its growth is so small during the first few weeks that it will not interfere with the development of the fruit crop; and on the other hand it keeps the ground closely covered during the winter. It does not interfere in the least with the annual cultivation of our orchards, in which I am a firm believer. I am aware that on many soils that are subject to drought it would be quite difficult to start it, but on many soils where moisture is abundant we have a great friend in crimson clover.

Mr. Ford: We are using rye as a cover crop. We have sowed rye in our orchards and have a good crop started to plow under next season. We have not had success with crimson clover at all. We have nothing to compensate us for the seed, let alone any other part of it, but I have seen a few patches where it seemed to be good. But even in garden soil in the village of Ravenna there was what appeared from the road to be an immense crop of crimson clover, and when you got into it there was nothing there. Of course the roots amount to something as a fertilizer, but so far as any foliage is concerned, it would not be one-fourth the amount of the common red clover. If I were sowing clover to leave until it got full grown, the Alsike or California clover has done the best and I prefer it to anything else.

Professor Selby: May I inquire who has sown the red clover for fall seeding?

The President: I did that this year. At the same time I sowed the crimson clover I sowed the red clover, and I cannot see but the red clover has got as much top as the crimson.

The Secretary: I do not think it will develop as rapidly in the spring. You see the crimson clover is an annual. I always sow my strawberry land in July, but you must have a moist soil to do that successfully.

Mr. Shirer: The question is, what are we going to do in the summer when the dashing rains come?

The President: There is a question of propriety in my following out this program this morning. We listened to a very interesting paper by Professor Green last night. We did not have quite as much time to discuss it as I think we would like. And now the question is, shall we go on with the program this morning or shall we take a few minutes,

say limit the time, and discuss the paper read by Professor Green last night?

Professor Selby: I move that we devote, say twenty minutes, to the discussion of Professor Green's paper, limiting speeches to three minutes.

Motion carried.

Professor Selby: I am not a horticulturist and I am not dealing in fruits, but as a botanist I beg to say a word or two upon the paper. I believe that the real thing presented by Professor Green yesterday was the principle by which varieties are to be judged, and this principle was founded upon a large number of observed variations. The principle, as I understand it, is, that the varieties that tend least to vary, or that vary least remarkably, are the reliable varieties, and that those that tend to most variations are least reliable. I believe that this principle is well established, and I only ask your indulgence to speak of it because I think if we are to be benefited we should know this, and so far as our observation goes I believe it is a thoroughly sound one.

Mr. Ford: I would ask if this principle refers to things grown from the seed and not to plants that are established?

Mr. Livingston: I can say but very little in reference to the paper, because when Mr. Green spoke, he was over yonder under the lamp and I could not hear, being a little deaf. That was all I wanted to say in reference to it. In some of the replies that were offered there were certain things said that my experience did not exactly agree with.

In reference to these mixtures: Ever since I was a small boy we have grown old Yankee pumpkins and yellow pumpkins, the Cushaw squash and the sweet pumpkins intermingled together. They are identical to-day as they were when I was a little boy, and I see no difference in the quality, quantity or anything else. Now, I have come to the conclusion from my experience that they don't mix. I do not believe to-day that anything will mix with the old Yankee pumpkin, or that the old Yankee pumpkin will mix with anything else, because my belief is that it is the same everywhere. But I find that the tomato mixes in a great many different ways. I find that when a bean mixes it mixes the whole stock; it don't mix as the Hubbard squash does. And my opinion is that every seed that has a film over it that will slip off, such as the Hubbard squash and all that class, will not mix, because they will run either one way or the other and the strongest would gain the most.

Mr. Shirer: The Professor reminds me of a preacher I once knew, who after reading all his books on theology was himself the most sceptical. After all, everybody has to have the measles once, and some have to get it often. Now, there is a fickleness in fruit, and let me relate an instance. Some years ago I had some sixty varieties of strawberries and I tried an experiment as they do at the Ohio Experiment Station, and

then I had some that I had cultivated for money. Now, there is a difference whether they are cultivated for experiment or cultivated for money, and where I cultivated for money I had an enormous crop, and those I cultivated for an experiment I was ashamed of. One I cultivated for money and the other I cultivated for an experiment.

Mr. Livingston: I forgot one point—that is about the honesty of seedmen. [Great laughter.] Now, I do not swallow all that he says, though when he sold the thing he may have believed it pure. When a man said that he could take tomato seed and plant it in the ground and get tomatoes in twenty-six days I believed he lied, and I don't believe there is a man in Ohio that believes him, and yet I believe he got a barrel of money out of it. [Laughter.]

Mr. Logenecker: There may be a practical part to this that we lose sight of in our humor. I fear sometimes that our seedmen have too much confidence in varieties not mixing or crossing, for I believe that among a number of our varieties or plants it is hard for us to get any variety that is true to its type. I doubt now whether there is any man who can find any true type of the Lima bean any more. There is another question in regard to whether or not it would cross in that same way. I have heard it said, for instance, that corn would not mix the first year, and I accepted it, but I have a variety of sweet corn with which I have been working for eight or ten years. I got some of the Mexican and planted by the side of it. There was no other Mexican to be found in all the country round, and yet the very first year I found those blue colored grains on the other sweet corn.

Mr. Ford: A few years ago I planted Ford's sweet corn in a nice clean place, and when I came to husk it the later ears contained the black kernels, and by carefully hunting I found within a half a mile where a man had a few hills of Mexican corn. It not only went over his buildings and barns, but over the maple grove in the cemetery and lodged and grew on the cob of Ford's early corn, and we have been unable since to absolutely eliminate it, but pretty nearly so by selecting single kernels of the best ears of corn for our planting. There is scarcely a kernel left, still it became so thoroughly mixed that it was a good deal of work to get rid of it entirely.

Now, in regard to beet seed, I will say that the principle of hybridization is such that it is impossible to breed seed unless you can get it onto an isolated island and grow it where the bees do not come from any other beet seed. One single beet in a field will more or less hybridize the whole thing, and I say that such a thing as an absolutely pure package of seed is utterly impossible. My friend speaks about the Cushaw squash, and I judge from what he said that the seeds do not slip their skin; but so far as the common field pumpkin is concerned, I know that they will mix with the crooked neck squash—that is, the second year.

Of course we do not see any effect the first year. While I am up I want to say a word about the Crosby peach.

The President: Your time is up.

Mr. Ford: I will just say this, that last season we had quite a large crop of the Crosbys, and if it is not a good peach we are stuck for lots of money. Last year it was as hardy as the Champion and the new Prolific and the Lemon, but the Stump in the same field did not bear one single peach.

The President: We did not quite finish our reports of standing committees. We will now listen to the report on Ornithology, by Mr. Pierce, who is the committeeman.

Mr. Pierce: One word in regard to pumpkins. As I understand it, our most scientific experimenters on this subject divide the pumpkin by stems.

Mr. Ford: How?

Mr. Pierce: I have no time to discuss. The pumpkins have pumpkin stems and squashes have squash stems. [Laughter.]

Mr. Ford: Let's have the difference.

Mr. Pierce: If you don't know the difference between a pumpkin stem and a squash stem, I cannot tell you.

REPORT OF COMMITTEE ON ORNITHOLOGY.

For many years my home has been a favorite nesting place for birds. The songs of blackbirds, robins, red birds and cat birds have filled the air from daylight until dark, there being from one to a dozen pairs of each within a hundred rods, while mourning doves, passenger pigeons, whippoorwills, thrushes, larks, kildeers, cuckoos, orioles, and many small birds nested in the vicinity. During the last summer, however, there was a noticeable scarcity of robins, cat birds, red birds, thrushes and orioles, although none were entirely absent. Ten years ago the drumming of partridges, otherwise known as the ruffed grouse, was a familiar sound in summer and in passing near wild grape vines in November one could always start the birds, who in turn always startled one with the sudden and unexpected whirl of their wings. For the last three summers I have neither heard nor seen a partridge, and I fear it will soon be extinct in Northern Ohio. Quail seem to be holding their own, but have not been plenty enough in the last thirty years to cut much of a figure in destroying insect enemies of the farmer. Quail often perish in a very severe winter, when there is deep snow on the ground, and I know of no way of preventing it. I am satisfied that they are shot in considerable numbers by sportsmen in the woodcock season, which begins in July, while the quail season does not come until November. I have no means of proving my belief, only that I miss the well known summer notes of quail soon after the woodcock season opens. The well known call is heard daily before July 15, but afterward becomes very scarce. There is nothing to prevent a dishonest sportsman from shooting them on the sly and putting them in his game bag, as no one but a regular game warden has a right to investigate. Of course, such birds are eaten at home, on the quiet. It is scarcely necessary to say that the clandestine shooting of quail at a time when they are either being hatched or just after, really defeats all the aims of the protective laws. In regard to other birds, I am not sure that there was really a scarcity. They may have kept more in the woods and swamps, there having been an unusual

abundance of all kinds of wild fruit. Hawks are very scarce, and no longer met with in the summer in the woods, where formerly they were quite common. Certain species are very troublesome in their semi-annual migrations, but last spring and this fall I have seen but one. The hoot owl seems to be disappearing also. Hawks and owls are popularly supposed to keep in check meadow mice, but the latter are not at all plenty. I recently saw an account of a flock of hawks passing for five hours over a certain point in North Carolina, there being many thousands of them. It seems scarcely creditable, as hawks are flesh eaters entirely, and such an army would need a commissary department to supply their wants. The very small birds are scarce around every home where cats are kept, the English sparrow alone being able to hold its own. Some would have it that the foreigner is at the bottom of the mischief, but my own observations on a clump of evergreens near my house, where two varieties of native sparrows formerly nested, satisfied me that it was the cat. Some would kill the cat, but I would not swap him for a five acre-lot full of chippies. He takes the young rats before they arrive at the age of discretion, and makes it so dangerous for the old ones that the place never gets overrun.

I suppose this society will expect a report upon birds in connection with horticulture, but I really have been unable to make any startling discoveries or profound observations. The cabbage aphid was quite bad on some of my cabbages, and in my heart I prayed for a drove of wrens and finches and other small fry to come and devour the lice, but they did not come, and I was forced to put up with the pest. I could have fed several hundred wrens for a week or more on cabbage aphid alone, but after the aphid were gone I should not have known what to feed them, and as it is only about twice in ten years that the cabbage aphid is abundant, I am afraid that one could not afford to keep a supply of small birds sufficient to be of real use in an occasional year. The law of supply and demand seems to be about as variable with birds as with potato bugs and grasshoppers, and I see no way by which the fruit grower can benefit his calling by either protecting or destroying certain kinds. A few winters ago a beautiful cemetery in Akron was the winter haunt of 2,000 crows. Now, without any apparent reason only a few come there. English sparrows vary annually in numbers without any seeming cause. Learned Experiment Station professors have shot "many birds of many kinds," and examined the various compartments of their viscera, carefully diagnosing and reporting upon the half digested bugs and worms found, but none have as yet told us how we can breed in unusual numbers the valuable varieties, or protect them from the perils of their semi-annual migrations and residence in countries a couple thousand miles distant. I have fed in the course of a long career many thousands of birds of more than forty species or varieties. I have begun with Governor Wood cherries and finished with Cuthbert and Golden Queen raspberries. They have always taken their choice and eaten twenty or thirty square meals a day, that is, if one can make a square meal on globular fruit, and after all this generosity on my part, when I have wanted them to help in destroying aphid and cabbage worms, and potato bugs and grasshoppers, I have always found them on other farms eating millet and oats and buckwheat. Some of them come back to help finish the blackberries, and pick holes in apples and pears and grapes, but their usefulness as bug catchers is extremely limited.

Theoretically and poetically I am a friend of birds, but when I quit the region of fancy and come down to the hard practical matters of growing cherries and berries for a living, I am inclined to think that the best use that can be made of a good many birds is to trim the beautiful hats of beautiful women.

Now, my friends, in closing this report, I wish to say that I am as fully aware as you are, that it adds very little to the knowledge of this society. After listening to the learned and interesting papers by three professors upon Entomology, Vegetable Pathology and Forestry, it seems still more unsatisfactory. It reminds me of a story told of Barney Barnatto, the South African millionaire comedian. In his

earlier residence in Africa he rented a house in Cape Town, which was very much out of repair. He repaired it at his own expense, and the landlord, instead of being grateful, raised the rent. This angered Barnatto, and he advertised in the local paper: "Wanted—At 16 Broad street, 100,000 brown bugs, by a gentleman who agreed to leave the premises as he found them." Now, in reporting upon the branch assigned me, I have done very much as Barnatto wanted to do with his landlord's house. I have left it as I found it. It is not in my case a result of malice, however. It seems to me of little use to discuss to any great extent horticultural ornithology, for as I hinted about the cabbage aphid, we cannot to any appreciable extent take advantage of friendly birds or punish unfriendly ones.

Let me give you an example to the point. Near the window where I write is a large nonpareil apple tree. A half dozen blue jays are hopping from branch to branch and pecking away at something. It may be clusters of insect eggs; it may be fruit buds. Now, if I investigate and find the birds friends in destroying insects, or enemies eating fruit buds, what boots it? I cannot destroy all the blue jays, neither can I materially increase their number.

Mr. President: I am pleased to see in the audience this morning Mr. Vandeman and Mr. S. D. Willard, and on behalf of the Society I extend to them a welcome, and hope they will feel free to take part in our discussions.

The President: The next paper is "Peach Culture on the Peninsula," by Mr. William Miller, of Gypsum, Ohio.

PEACH GROWERS ON THE PENINSULA.

When your Secretary, in a note a few weeks ago, said he wanted to give the program at this meeting a strong peach flavor, and asked me to assist, the first thought was of the absurdity of "carrying coals to Newcastle." It would be equally absurd for me to attempt to teach Athenians peach culture. So I will only attempt to tell you how we do it on the Lake Shore, and mention some of the things learned during twenty-five years' work and study in the peach orchard. If the statement of our methods will cause Athens growers to tell of better methods, it will not be labor lost.

The "Peninsula" referred to in the program is not the peach growing section known as the Delaware peninsula, but that little point of land jutting out into Lake Erie near its western end. This with the adjacent island of Catawba, has become noted for both quality and quantity of the fruit grown. From small beginnings late in the sixties, the business has enlarged until nearly all the land suitable for peach growing has been planted to trees. Adjacent localities on the main land have caught the fever, and unless overtaken by some disaster will soon claim a share in the profits.

The first venture in commercial fruit growing was made about 1860 in cultivating the Catawba grape. The climatic conditions made it the ideal locality for that fruit. Observing men were not long in discovering that the same conditions would be favorable to the growth of the peach. It is a level land, mostly heavy clay, lying much of it not more than ten or fifteen feet above the water of the lake. Similar level lands, not a proximity to bodies of water, would be the least desirable for peach culture. But here the lake regulates to some extent the climate. The water modifies the extreme cold of winter, and covered with ice in the spring retards the advancement of vegetation until danger from frost is over. In autumn the water, retaining the heat of the summer sun, keeps away frosts until bud and wood are well ripened, enabling both to endure severe cold.

The first plantings were largely of the very late varieties, seeking to find a market after the earlier sorts grown in other localities were gone. After a time, those making peach growing a specialty found that it would be better to have fruit ready for market all through the season. It enabled them the better to keep labor employed, and consumers looking only to our locality for a supply. Now the most successful orchardists aim to have varieties so ripening as to make harvesting a business the season through.

The conditions with us are so different from those in Southern Ohio that our methods may not be applicable here, but there are some things it is necessary to observe everywhere if commercial peach growing is to be made successful. Competition is already keen, and in the near future must become more so, and none but those who take advantage of every improvement in methods will succeed.

Trees should always be purchased in the fall, of some reliable nurseryman in a locality not subject to yellows, root galls or scale insects. Then the nurserymen have a better supply of all varieties, and better selection of varieties can be made. Trees taken from nursery rows are not well ripened, and they need careful handling to get them through the first winter without injury. The practice of some nurserymen of cording them up in the cellar is better than leaving them in the nursery row, but the air is often too dry, and the vitality of the tree is too much reduced. The best way for the grower is to purchase trees in the fall, select some dry location and reel them in deeply, inclining the tops to the south, and having all the roots in contact with the soil. As cold weather approaches cover the whole top with soil, or to the point where they are cut off at planting time. This protects the tree from excessive evaporation, and protects from severe freezing. By having them at hand in the spring, planting can often be done long before the nurseryman can deliver his trees.

Clay land should be plowed in the fall, as the mellowing of the soil by freezing will be a great help in the labor of planting. On our level lands many plow so as to plant the tree on the ridge in the center of a narrow land. This assists in drainage and makes a deeper, mellow soil for the tree roots. As to distance apart, a great variety of opinions exists. The earlier plantings were all one rod apart. The tendency now is toward a greater distance.

The selection of varieties is a very important matter. Years of time have been lost by many in learning that the list of varieties which should be planted in a commercial orchard is a very small one. Some of the finest peaches, like Globe, Wheatland, Susquehanna and others, do not bear enough to be profitable. The fruit of some of the best varieties is too tender to stand rough usage in shipment to market. Others ripen at a time when larger and better varieties are ready for shipment. Some are very subject to injury from fungous diseases. When the objections are all in, the list of profitable market varieties is small.

In our locality the Smock, Salway and Late Crawford exceed all other sorts in the quantity of fruit now harvested. Several local varieties are very popular. The Lockwood, a variety similar if not identical with St. John; Heidelberg, a mid-season variety, valuable for its time of ripening; Briner's Yellow, Reynolds, Hadden, are sorts not found in the catalogues, but are all valuable. The phenomenal success of the Elberta has created a great demand for trees of that variety. So far it is the best all around peach propagated. A list suitable to one locality might not be the one which should be selected for another. Varieties do not behave alike in all localities. A good rule is to plant the varieties your nearest successful grower has found profitable.

The selection of the best site which can be found, and planting the best varieties which can be found, will not make a profitable orchard. Three other things are essential, and each are of greater importance than any I have named. They are pruning, thinning and cultivation. The pruning should begin before the tree is

planted, and continue during its productive years. But it is most important that it be well done for the first three or four years. The roots may be pruned much more than is generally supposed. Much of the tap root and most of the lateral may be safely cut away. It may not be profitable to shorten so severely, yet a cutting away of all unnecessary or broken roots will be a benefit to the tree, and greatly expedite planting. One of our most successful growers recently suggested that if the roots be thoroughly pruned in the fall, the wounded surfaces would granulate during the winter, and root growth would begin much earlier in the spring. At planting time the top should be pruned to a straight whip, not more than thirty inches high. With the modern implements of cultivation there is no need of having the top formed as our fathers used to, so as to allow a horse to walk under the branches. By forming the top low there is less danger of injury by high winds, and the harvesting is much more easily done. The pruning the first year should consist in shortening the leading branches of the last year's growth, and distributing the branches along the stem left at planting time, and having the branches radiate from a common center. If properly distributed along the trunk, a branch broken by high winds or an overload of fruit works no permanent injury to the tree. Pruning after the first year should consist of shortening the main branches so as to form a short-jointed compact head. Continue this shortening process each year, doing the work when the wood is dormant. In this way the trees will be kept low and the fruit within easy reach. Low trees properly pruned will support all the fruit a tree ought to carry; the expense of ladders will be saved, the fruit can be more rapidly harvested, and ten years may be added to the profitable lifetime of a tree. If vigorous growth is allowed each year without shortening, in a few years the weight of fruit is borne at the long end of a lever, which soon causes branches to break, destroying the usefulness of a tree when it ought to be in its prime. Many make the mistake of thinning too much the small twigs from the inside branches. They will bear just as much fruit as is grown on the tree. If they become too thick nature will indicate when they should be removed. Much of the work of thinning may be done by judicious shortening of the annual growth. This can be done in winter, before the busy season begins.

A question might arise here as to what should be done with old bearing trees which have not been trained up in the way they should go, and bear fruit only at the end of long spreading branches—a condition existing in many orchards in all peach growing localities. My suggestion would be to head them back severely. Should a crop failure follow, it will give the trees a chance to make ready for better crops. If a good crop follow you will only do the proper amount of thinning. In no case will a mistake be made. In no case should severe pruning be done after the flow of sap has started; always when the wood is dormant.

No greater calamity can befall the peach grower than to permit his trees to overbear. While total failure brings no returns, the labor and fertility are not lost. But with an overload of small fruit no profit comes to the owner, he loses labor and packages, and worst of all the ripened pits rob the soil of fertility without compensation. It is the ripening pits which rob trees of vitality and soil of fertility.

Ten years ago we often heard discussed the question as to whether it was profitable to cultivate peach orchards. But it is no longer an open question. Now our orchardists would as soon plant corn in a meadow and expect a crop as to expect a peach tree to produce good results in like situation. The good results are not always apparent the first year, but continued growth must be secured to produce continued cropping. Many plow away from the trees in the spring, then harrow the ground, and by the middle of June plow again, throwing the earth toward the trees, using the harrow afterward to keep the surface smooth. Others do not use the plow at all, but loosen the ground in the spring with a disc or cutaway harrow, doing all after cultivation with the same tool or a common harrow, aiming at all times to keep

a mulch of mellow earth upon the surface. As soon after rain as the ground is dry enough, the harrow is started to break the crust and renew the mulch at once. With proper treatment of the soil irrigation is unnecessary in this climate. It was an old theory that cultivation should cease by midsummer, that the wood might have time to ripen well before winter, but it is found that it is better to continue cultivation until the fruit is about to ripen. This is especially advantageous in a dry season. It is the new growth started after an interval of rest that is too tender to stand the winter. If kept growing all summer the wood will ripen and fruit buds develop in good form.

After having grown the trees, pruned and thinned and cultivated, the work is far from being done. To know when and how to pick, pack and market, requires watchful care, good judgment and business ability of no mean order. To do these things properly, when the grower has much to do, he needs to have all things ready. The wagons in order, the packages ready, the labor employed, the packing house ready, and the market provided. It is better to have too much help than to permit the fruit to get too ripe for want of labor to care for it at the proper time. Where the grower markets his own fruit and is obliged to call to his aid that necessary evil, the commission man, it is well to have him ready also. Pick one firm where you expect to market most of your fruit of known good reputation. Ship to only one. Use him right and you will not often have reason to complain, if your part of the work is done as it should be. Avoid the wiles of the ever present drummer, who would have you "give our house a trial shipment."

I cannot speak too highly of the shipping associations in our locality. With managers whose sole business it is to look after the marketing, they give their members a chance to devote their whole time to their orchards. One member claims that the individual is lost, and can gain no reputation of his own. But this is an age when the corporations and combines swallow the individual, and the fruit grower must take his chances with the rest.

It would require a book to name all the points useful to the grower of peaches but I have already tried to mention some of the essentials of successful culture on the lake shore. Yet they are essentials everywhere.

Will peach growing be overdone? is a question that has been asked over and over again, and never with greater apprehension than now. The low prices which have prevailed for farm products for several years have led the farmer to look about for some crop which will bring better returns. In many localities peach growing seemed most inviting. The oily-tongued tree agent has told his story of fabulous wealth in the peach orchard, and trees have been planted on a larger scale than ever before. What shall the harvest be? Let us see. Many will be planted on soil not adapted to their growth; some where market facilities are not good, and the expense of marketing such a bulky product will be too great. Some planters are not adapted to growing fruit, and after one or two failures they will be chasing some other rainbow. It will be the old story. Some will fall by the wayside, some among stony places, and some among thorns. Good crops and good prices will not always come. Failures will discourage many, and we need not look for an over-production for any great length of time.

On the other hand, the planter who keeps abreast of the times, makes the business a study, learns the wants of the market, and aims to supply them with the best that can be grown, may congratulate himself on having a pleasant and profitable occupation, one which gives opportunity to study and develop a high standard of rural ability. Peaches cannot be grown or harvested by steam or electricity. On that fact rests the hope of the business. The individual is not subordinate to the machine, as in many occupations. There will always be a market for good fruit. To those who produce only the best, the orchards will bring forth some a hundred fold, some sixty and some thirty.

The President : I know some of you would like to discuss some of the points brought out in this excellent paper, but you see we are having three dishes of peaches this morning. Let us hear them and then discuss them fully. I am pleased to announce a paper on "Commercial Peach Culture," by Professor Taylor, Assistant Pomologist, Washington, D. C.

COMMERCIAL PEACH CULTURE.

By WM. A. TAYLOR, ASSISTANT POMOLOGIST, DEPT OF AGRICULTURE.

There is probably no subject connected with orcharding that has, at various times, attracted so much attention in this country as commercial peach growing. It has at some times and places been heralded as the sure road to wealth which anyone possessing land (and money with which to buy trees to plant) might travel. In some instances small fortunes have been realized by growers who planted trees of untried varieties in regions where successful peach culture was not previously known to be possible, and "booms" more or less inflated, have resulted, under the fostering care of men with trees to sell. The occasional bonanza orchard which yields a large return in fruit and dollars for a small outlay of thought and capital, together with the desire of mankind to "get rich quick," has unquestionably done much to stimulate the planting of inferior varieties on unsuitable sites, by men who never should have attempted commercial peach growing. The experience of the past two seasons has demonstrated to the most enthusiastic orchardists that the day of high prices in seasons of abundant yield for any other than superior fruit, is past. Our orchard areas are not sufficiently large and widely scattered, and our transportation lines sufficiently efficient to equalize the supply and distribute it to accommodate the demand. The orchardist who contemplates planting peaches cannot now include in his estimates of profit and loss the high prices for fruit in off years which were commonly had ten or fifteen years ago.

It is, therefore, my judgment that there is little to encourage a planter at the present time to risk his entire capital in peach orcharding, unless, perhaps, he has peculiar advantages in the important points of climate, site, soil and proximity to good markets, together with experience in orcharding. On the other hand it seems to me that at no time has there been so favorable an outlook for the planter who makes peach growing a "side line" to be carried on in connection with other lines of fruit growing or even with general farming, if he is within a few miles of a thriving town or city not already provided with a home supply of peaches. The experience of growers as disseminated through our Horticultural Societies and other educational instrumentalities gives the prospective planter of to-day a great advantage over him of twenty years ago in the important points of suitability of sites, soils, varieties, methods of cultivation and pruning, the combatting of injurious insects and diseases, etc., so that he can determine with some degree of accuracy the probability of success if he plants an orchard.

At the outset he should clearly comprehend that the possibility of profit in peach culture is largely dependent upon the fact that the peach is peculiarly susceptible to injury by unfavorable climatic and soil conditions, as well as to the attacks of numerous insects and diseases which attack both tree and fruit. If it were not so the average family outside of the business districts in our large cities could grow its own supply of peaches in the home garden and there would be little demand for the product of the commercial orchardist. If he is not so situated that he can escape these injuries or prevent them in large measure it will be useless for him to plant a peach orchard. He should, therefore, first consider the requirements of the peach as viewed from the standpoint of one who contemplates an investment in a new enterprise.

SITES.

Without doubt the most important consideration in the central portions of the United States is the selection of a suitable site for the orchard. On this will depend in large measure its success or failure in fruit production, for on the choice of site will depend in large degree that equability of climate which is essential to the preservation of the blossom buds during winter and spring. The largest areas suitable for the peach are usually found near bodies of water of sufficient breadth and depth to remain partially open during the coldest weather of winter. Some of the safest locations, however, depend for their equability of climate upon their comparative elevation above the adjacent land. Some of the best locations are highlands along rivers, where ravines and gulleys afford prompt and sufficient drainage for cold air during winter and spring. Such sites have the further advantage of being more easily cultivated and cared for than hill lands, an important consideration when fruit marketing is in progress. If it is known that the temperature in winter on a particular site drops lower than 10 degrees, Fahrenheit, oftener than once in four or five years, that locality should be regarded as dangerous for the peach, though the hardier varieties will, if entirely dormant when the cold is experienced, sometimes produce an abundant crop after a winter temperature of twelve to fifteen degrees, Fahrenheit. If the temperature is known to go lower than eighteen or twenty degrees, Fahrenheit, peaches should not be planted, for it is rare that the trees experience such temperature without serious injury to the trunks or the killing back of young wood. Locations which escape severe cold in winter are usually safest from late frosts in spring, but this is not true in all cases, so that where there is room for choice a gentle northern slope should be chosen, on which blooming will be somewhat retarded and the danger of injury by frosts be lessened.

SOILS.

Closely allied to the site and necessarily to be considered in connection with it is the question of the soil best adapted to peach culture. Provided it is not shallow, wet, nor very rich, almost any soil will grow thrifty peach trees, and produce good fruit if favorably situated and properly handled. It should be deep, free from excessive moisture and porous rather than tenacious in character, if the best results in fruit culture are to be expected. If shallow, or underlaid with compact stratum, the land should be thoroughly subsoiled, and if any springy or wet spots exist these should be deeply under-drained. If wet areas larger than one-fourth or one-half an acre in extent are found, it will usually be best to plant them with some other tree or crop, for peaches can but rarely be made to succeed on such spots, even with the best of treatment. Sandy or gravelly soils usually yield fruit of the best quality when properly cultivated and fertilized. Rich and "fat" clays are exceedingly difficult to manage, and peach orchards on such lands are rarely long-lived or profitable.

VARIETIES.

Next in importance to the selection of a suitable site comes the choice of varieties for planting. In some respects this is, in fact, the most important branch of the subject, and the one about which we have the least definite and exact knowledge, because of our inability to determine the causes which operate to modify the behavior of varieties when they are transferred to different locations than those in which we have observed them. While there are a few sorts which give general satisfaction and are profitably grown over a wide expanse of territory, it is frequently found true that some local variety is very much superior in a given locality to the well known varieties that are generally recommended. The best list of a commercial peach orchard is, therefore, that which is based upon the long experience of a

careful grower in the immediate vicinity of the proposed planting, and whose orchard is located on a similar soil. The recommended list of any grower will be found to vary considerably from year to year, both in the varieties listed and the proportion of each to the whole number planted, for new combinations of weather bring out new peculiarities of varieties each year. On this account it is the wiser plan to select at least six or eight varieties in planting a first orchard, particularly if they have not been tested in the vicinity for a number of years.

In a general way it may be said that the white-fleshed varieties succeed much better on sandy, dry and deep soils than on those which are more moist and tenacious in character, while the yellow fleshed varieties as a rule succeed better on the heavier, stronger soils. This fact should be borne in mind in making up the list. In most markets the yellow-fleshed varieties are in greater demand than the white-fleshed sorts ripening at the same time, while freestones are commonly preferred to clings. The relative hardness of varieties is also an important point to consider in all regions where the peach crop is an uncertain one. The hardness of blossom buds depends upon two quite distinct points—resistance to intense cold in winter and lateness of blossoming in the spring. Fortunately, most of those varieties which are known to endure low temperature are also late in blossoming, and with few exceptions they are characterized by "large" blossoms, like Alexander and Hill's Chili, while the more tender varieties like the Crawford (early and late) have "small" blossoms. The most notable exceptions to this rule are Louise and Smock, both of which belong to the hardy group, though neither has large blossoms. Unfortunately for lovers of the peach, I must confess that none of the very hardy varieties which I know produce fruit as delicious in flavor and of as high quality as that of some of the more tender varieties. It is, therefore, open to question whether it is not wise to include both types in a commercial orchard; the more tender varieties of high quality for the years when there is a full crop of all sorts, and when none but choice fruit is in demand, and the more hardy varieties, which, though inferior in quality, can be depended to produce fruit almost every year. The most thoroughly tested varieties of each group with which I am familiar are listed below:

HARDY VARIETIES.

White-fleshed.

Alexander,
Rivers,
Hale,
Louise,
Early Michigan,
Lewis.

Yellow-fleshed.

Barnard,
Hill's Chili,
Wager,
Golden Drop,
Beer's Smock.

MORE OR LESS TENDER VARIETIES OF MERIT FOR COMMERCIAL PURPOSES.

White-fleshed.

Mountain Rose,
Large Early York,
Oldmixon Free,
Stump,
Stevens Rareripe,
Keyport White,
Heath Cling.

Yellow-fleshed.

St. John,
Reeves Favorite,
Crawford Early,
Elberta,
Choir Choice,
Crawford Late,
Salway.

From the record of the Crosby during the four years since it has been planted outside of its native state I am hopeful that it will prove to be entitled to a place in the "hardy" group. It is possible also that Elberta will gain entrance there. It has not yet been sufficiently tested to entitle it to that place. The parentage of the new early peach, Triumph, would indicate hardness also, and it will be strange, indeed, if we shall not find among the many claimants now before the public some

varieties which are not the equals or superiors of any we now have in this respect. Bequette Free, white-fleshed, and McCallister, yellow-fleshed, are also exceedingly promising. Their hardiness is yet to be proved.

NURSERY STOCK AND PLANTING.

Other things being equal, the planter will usually find it to his advantage to secure his trees near home. If possible he should visit the nursery and examine the stock in the rows during the growing season. He can, in this way, form a much more intelligent opinion concerning the thrift and healthfulness of the stock than by viewing it in the bunches when ready for delivery. Trees grown on rather dry soil of modern fertility, which ripen their wood early in the fall, should be preferred. The stock should be from seeds produced by trees of known healthfulness, or if the trees are grown in a region where such cannot be obtained they should be from seeds brought from a region free from disease. It is believed by most growers that trees budded direct from bearing trees will bear earlier and be more productive than those propagated through many generations of nursery stock. Whether true or not it is wise to secure stock that is not more than two or three removes from bearing trees to lessen the probability of error in the matter of correctness of varieties. Whenever possible the bearing trees to which the stock traces should be visited and inspected during the fruiting season in order that comparison of foliage may be made to determine the connections of the varieties and the character of the stems propagated. Medium sized trees, say three to four feet in height, and moderately stocky, are commonly best, though smaller ones, if clean and healthy, frequently make as fine orchards. The buyer should insist that the trees reach him with the roots on and with the trunks sound and free from serious bruises. If he can go to the nursery himself for the trees, so much the better. Roots should be kept moist in transit by covering with damp straw or blankets, and the trees should be promptly and carefully heeled in if not intended for immediate planting. Early orders and fall deliveries are most satisfactory to both nurserymen and planters. Fall planting is safe on dry soils in mild climates, and is preferable to spring planting in the South, but is more or less uncertain north of the Ohio river. If planting cannot be done until spring the root pruning of the trees in the fall before heeling in will be found beneficial, but the pruning of the top should in all cases be deferred until spring.

Early spring planting is generally safest and on most soils it will be much better for the trees if the ground has been used for cultivated or sowed crop the previous season and plowed late in the fall or early in the winter. Such soil is ready for planting as soon as it is workable in spring, and two or three harrowings will put it in fine condition. The preliminary plowing should be as deep as the soil will permit, and as was previously noted it should be subsoiled if underlaid by a compact stratum of clay or hardpan, though preparation by horse-power with plow and harrow will lessen the cost of planting and leave the soil in better condition for the growth of the trees. With such preparation the holes need not be dug larger than is necessary to simply accommodate the roots and enable the planter to align the tree. As in all tree planting the earth should be thoroughly firmed about the roots, but left loose at the surface. Trees should be pruned to straight trunks, and after planting cut back to the point where it is desired to form the head.

CROPPING, FERTILIZING AND CULTIVATION.

Some successful growers deprecate the practice of growing any crop in the young orchard. My own observation would not lead me to fear any injury from the planting of corn or beans among young peach trees, on soils of average fertility, for at least two years.

Cultivation must be thorough until after midsummer, and should then cease, to permit the wood to ripen. After the second year, there is rarely a profit in attempt-

ing to grow an inter-crop in the orchard, because of the extra expense in cultivating it as compared with the use of the harrow in orchards free from other crops. If the soil is not sufficiently fertile to produce a thrifty growth of wood during the first two or three years, without the application of fertilizer, the inter-crop should by no means be planted. Where lands are exposed to winds or subject to washing by rains during the winter, a cover crop sowed in the fall and plowed in the early spring is often an advantage. Rye answers a very useful purpose and is particularly valuable on light soils and bleak hilltops, though in situations suitable to its growth crimson clover, will, no doubt, be preferable on account of its greater fertilizing value. On soils of average fertility the plowing in of cover crops will usually be all the fertilizing needed until the trees are three or four years old. After that age, when its coincident fruit production is reached, wood ashes can be profitably applied in considerable quantity on most soils. Ground bone and dissolved South Carolina rock, in connection with muriate of potash or kainit are frequently profitable, their use causing not only greater fruit production, but also improved color and quality. The most profitable application of these fertilizers must be determined by actual experiment in each orchard, but a test application of one or two pounds of high grade muriate of potash with four or five pounds of ground bone to the tree, applied in the fall and worked in, will enable the grower to determine the probable needs of his own soil in this regard.

Cultivation after fruit bearing begins must be thorough. If the land was clean to start with, it can, on sandy or gravelly soils, be kept so for several years without plowing, though on blue grass soils the plow is required almost every season. Plowing should be shallow after the first two years, say two and one-half to four inches deep, according to the character of the soil, and harrowing should be frequent. The surface must not be allowed to crust or bake during the growing season, and to prevent this a thorough harrowing once every week or ten days is none too often. Alternate treatment with cutaway or spading harrow and some form of smoothing harrow, such as the Acme or the Thomas, will usually be found to keep the soil in good tilth, particularly if a cover crop has been plowed under in early spring. The importance of thorough cultivation in peach orchards can hardly be overestimated, and many failures are traceable to its neglect.

DISTANCE AND PRUNING.

These are points on which our leading authorities on peach culture do not agree. Some advocate wide planting and little pruning, others close planting and rigorous heading back. Most growers, except in the Chesapeake Peninsula, are agreed, I think, that low heading, say eighteen to thirty inches, is preferable to the high heading formerly practiced.

A somewhat extended observation in commercial peach orchards has convinced me that the determination of distance between trees and the style of pruning to be adopted should depend largely upon the character of soil and the class of varieties planted. On strong soils or on lighter soils heavily fertilized, close planting and heading back should be practiced, and this is doubly true if the hardy varieties, most of which are dwarfish in habit, are planted, for without close heading back or expensive hand thinning, the fruit of most of them will be inferior in size and quality. The stronger growing varieties on the other hand require more ground room, and as they do not commonly carry a large crop of live blossom buds in the spring, do not require or permit of close heading back.

Sixteen to eighteen feet apart for the dwarfish, hardy varieties, and twenty for the stronger growing kinds will be found satisfactory on most peach soils. During the first year little pruning is necessary after the removal of the original branches and the cutting back of the trunk to one and one-half or two feet, except the rubbing off of superfluous buds in early spring. It will pay well to do this even at the

expense of going over the orchard two or three times at intervals of two weeks during the spring and early summer. Six or eight strong shoots well distributed about the trunk should be saved for the future head and all others should be removed. Before growth begins in the second season after planting, these branches should be cut back somewhat, say one-third or one-half of their growth. The third season this cutting back should be repeated and such thinning out of interior branches as may be necessary to permit free entrance of air and sunshine should be done. With the hardy and productive varieties the same practice should be continued every year; with the more tender sorts I am not sure whether this close heading is the better method.

As trees increase in years and begin to show dead twigs and branches all weak branches should be removed or cut back each year. Choice fruit can only be had from strong, sound wood of the previous year's growth, and if a considerable proportion of the top be not of this character the care of it will prove useless labor. Neglected trees that yet remain sound in trunk and root can sometimes be made to produce a few crops by closely heading back their main branches and growing a partial new top. Open forks should at all times be avoided, to lessen the danger of the splitting down of branches when heavily laden.

THINNING.

Much of the fruit thinning necessary can be done with the pruning shears, but some will need to be done by hand. No fixed distance apart on the twig can be named, but in general not more than three or four specimens could remain on the growth of a single terminal branch, and but rarely more than one or two be left on the weaker twigs. It should not begin until after the "June drop" is ended. *Over-bearing must be prevented*, or the orchard is doomed to speedy decay. A single "full crop" will often so exhaust the vitality of the trees that subsequent high cultivation and fertilizing will fail to revive them. This is particularly true if for any cause there is an insufficient supply of moisture or fertility available at the time of heavy bearing, and in such case the fruit fails to mature well and is chiefly useful as a producer of "gluts" in the market.

Thinning reduces the number of peaches, but frequently increases the yield in bushels. It always reduces the drain upon the vitality of the tree and it usually yields a prompt return in the shape of higher prices. Mr. R. Morrill, of Benton Harbor, Michigan, states that in 1895 he put in seventeen and one-half days' work per acre in pruning and thinning upon one of his orchards, but that he procured from 400 trees of one variety, in that orchard, 1,500 bushels of fruit. He, with others of similar experience, believes that it pays to thin peaches in commercial orchards.

INSECTS AND DISEASES.

The peach tree borer and the curculio are sometimes exceedingly troublesome, but can be held in check by thorough practice of methods already well known. The fruit bark beetle threatens to become troublesome in some sections, but is now in the hands of his friends, the entomologists, who may be expected to eventually show us how to manage him.

Yellows and curl leaf are serious foes, but the damage done by the latter has been found to be materially lessened during the past two or three years by spraying of the trees with a rather strong solution of copper sulphate before growth starts in spring, while the former can be kept in check by destruction of diseased trees as soon as they show the first symptoms.

MARKETING.

If the grower is so situated that he has a home demand for his product, the question of marketing is easily solved. Careful picking, handling, assorting and

packing are essential, and the skill needed to perform the details rapidly and well can only be obtained by experience. Neatness and carefulness should characterize every operation, and no careless work should be tolerated. The degree of ripeness which peaches may be permitted to reach before picking must depend chiefly upon the distance to market and the mode of transportation. They should in all cases be left as long as is found consistent with safe shipment. The style of package best suited to the use of the grower will depend upon the kind of trade he aims to supply, but in general it will be found that in years of large yield only the choicer grades can be profitably marketed in packages holding less than one-half bushel. The package without fault has not yet been made, and may never be, but there can be no question but that a marked advance in neatness, lightness, beauty and cheapness of fruit packages has been made in recent years.

Sales direct to the consumer or to the retailer are the most satisfactory, and next to these, to the wholesaler or shipper. With all of these the grower can have personal contact and an opportunity to determine whether he is being fairly and honestly treated. Unfortunately, however, most growers are compelled to depend upon the consignment system, under which they are almost entirely dependent upon the honesty and truthfulness of the consignee. Under this system the grower can undoubtedly do best by arranging with a commission house of good reputation to handle his crop, and then making regular and frequent shipments. With well grown fruit, carefully, neatly and honestly packed, labeled with the name of the variety, and shipped with his own name and address, he can soon establish a good reputation in the market and be reasonably sure of getting about what the fruit is worth. If he is then not too far from market nor dependent on a single means of transportation, he may feel sure that there will be a fair margin of profit left for him after the various expenses of growing and marketing have been paid.

The President: We will now listen to a paper by Professor Selby on spraying peaches.

Professor Selby: I shall offer some brief statements of results of the last two years of spraying peaches, conducted by the Botanical department of the Ohio Experiment Station, at Gypsum, Ohio, through the cooperation of Mr. William Miller.

SPRAYING PEACHES.

By AUGUSTINE D. SELBY, Wooster, Ohio.

During the season of 1895 and 1896 the Botanical Department of the Ohio Experiment Station has conducted experiments in spraying peach trees at Gypsum, Ottawa county, through the cooperation of Mr. William Miller. The results of the season of 1895 in preventing the postular spot* of the fruit were given one year ago, with the statement that no effect upon leaf curl was observed. The results of the past season's trials are decidedly encouraging, and it might be said favorable. These are presented to the Ohio Horticulturists at the first opportunity.

PEACH SPRAYING IN 1896.

The experiments were conducted by the Experiment Station in the bearing orchards belonging to Mr. Miller, and situated upon the Peninsula, Gypsum, O. The trees were of the Elberta variety, four, seven and eight years planted, and Salways, seven and twelve years of age. There is considerable variation in the age of trees

*Microscopic examination of the season has shown that the fungus *Helminthosporium car-pophilum* Thum. is present in these fruit spots.

among the older Salways, and locally among the seven and eight year Elbertas, due to repianting. All the orchards containing the sprayed and unsprayed trees were maintained in the best possible state of cultivation by the proprietor, Mr. Miller. The first cultivation, with the harrow, was given as early as the team could be safely put upon the ground.

The plan of work, contemplated treatment to prevent the leafcurl (*Exoascus deformans* B.) and postular spot upon the Elberta variety, and to test the effect on scab (*Cladosporium carpophilum* Thum.) upon the Salway sort. In the younger Elberta trees, scab prevailed to a greater extent than the postular spot, and in that particular there was deviation from the plan.

The fungicides used were Bordeaux mixture, chiefly what may be called the 75 gallon and the 150 gallon formulæ and a solution of copper sulphate alone. The 75 gallon formula is the dilute Bordeaux mixture of the Ohio Station† and is the strength employed on apples, plums and grapes. It is made by using four pounds of copper sulphate in solution, and four pounds of unslaked lime to 50 gallons of water; that is, 75 gallons of solution is made from every six pounds of copper sulphate. This solution was used only before the buds opened. It appears to be of greater strength than can be safely employed upon peach trees in foliage. The solution of copper sulphate is made by dissolving four pounds of the sulphate in 50 gallons of water. It, also, was only used before the buds opened and would injure the foliage later. The 150 gallon formula of Bordeaux mixture, which was used after the first time contains two pounds of copper sulphate and two pounds of lime to 50 gallons of water, or 150 gallons of mixture to six pounds of sulphate. It is half the strength of the mixture used before the buds opened, and should be reduced in strength rather than increased, on account of the effect on the foliage.

In recorded spraying results in America, Bordeaux mixture has, generally, so far surpassed other compounds that the trial was limited as stated. The number and time of application was varied to learn the minimum number of required sprayings and the best time for them.

The first application ‡ was made on peaches April 18th and April 20th, 1896, just before the blossoms opened; the second, May 7th, just after the bloom husk or calyx dropped from the fruit; the third, May 22d and 23d, and the fourth, June 3d to 5th.

It has seemed well to refer to the sprayings as first, second, third and fourth, and to the trees as receiving the first, second, third and fourth, etc., because of period suggestions in these statements, without repeating these dates. There are some serious objections to the plan, however.

EFFECT UPON LEAF CURL—*Exoascus deformans*.

In 1895 no indications of leaf curl prevention was observed. In 1896, on the contrary, the difference between the treated and untreated trees was very marked; the differences, summarized below, show a prevention of about 94 per cent. of the curl.

ON ELBERTA TREES SEVEN AND EIGHT YEARS OLD—SOUTH ORCHARD.

Total number of leaves affected with curl:

Row 4—3" and 4" sprayings, 6 trees, 545 curled.

Row 5—Unsprayed, 6 trees, 755 curled.

Row 6—3" spraying only, 6 trees, 132 curled.

†Bulletin No 9, Vol. IV., 1891. Bulletin No. 48, 1893.

‡In 1895 the first application on peaches was made April 23-26; the second, May 10; the third, May 21-22. The first and second sprayings are determined by the development of the tree, and not by fixed dates.

Row 7—2", 3" and 4" sprayings, 6 trees, 82 curled.
 Row 9—Unsprayed, 6 trees, 2,028 curled.
 Row 10—1", 2", 3" and 4" sprayings, 6 trees, 47 curled.
 Row 15—1", 2", 3" and 4" sprayings, 5 trees, 18 curled.
 Row 16—Unsprayed, 5 trees, 590 curled.

ON SAME VARIETY FOUR YEARS OLD—NORTH ORCHARD.

Total number of leaves affected with curl on trees counted:

Row 7—2", 3" and 4" sprayings, 3 trees, 168 curled.
 Row 8—2", 3" and 4" sprayings, 3 trees, 138 curled.
 Row 10—Unsprayed, 9 trees, 3,339 curled.
 Row 11—1", 2", 3" and 4" sprayings, 9 trees, 176 curled.
 Row 13—1", 2", 3" and 4" sprayings, 4 trees, 374 curled.
 Row 14—1" and 2" sprayings, 4 trees, 31 curled.
 Row 15—Unsprayed, 4 trees, 1,738 curled.

In both cases the trees in adjacent rows are adjacent to each other and under as nearly the same conditions, otherwise, as possible.

Upon Stevens' rareripe and Ellison the comparative effects on leaf curl was not widely different from those on Elberta, though the total amount of leaf curl on these sorts was much less than on the Elberta.

It is necessary to mention that these sprayed and unsprayed rows of trees were, likewise, treated and untreated in 1895, and it is difficult to separate the cumulative result from that due to last season's spraying.

EFFECT OF SPRAYING UPON THE FRUIT OF ELBERTA PEACHES.

SOUTH ORCHARD.

No. row.	No. trees.	Treatments received.	No. pchs.	Yield bush.	*No. sp'td total	*No. b'dly sp'td.	*Per. cent. sp'td.	Pchs. No. in bu.	No. to a tree	Foli- age.	Age of trees.
2	37	3"-4"	6625	43 $\frac{1}{2}$	271	11	4.09	153	179	.....	7&8 yrs
8	35	2"-3"-4"	5957	37 $\frac{1}{2}$	62	1	1.04	160	170	.....	"
†6	35	2"	4574	27 $\frac{1}{2}$	300	47	6.56	168	.....	.....	"
†10	12	2"-4"	1427	6 $\frac{3}{4}$	36	3	2.54	.....	.....	.....	"
5	38	Untreated	6908	47 $\frac{3}{4}$	1140	212	16.50	145	182	P'me	"
9	33	"	7539	46 $\frac{3}{4}$	1186	223	15.73	161	228	"	"
16	33	"	5509	36 $\frac{1}{2}$	950	161	17.25	152	167	"	"
11	33	1"-2"-3"-4"	5518	31 $\frac{1}{2}$	61	.....	1.11	177	167	.....	"
14	31	1"-2"-3"-4"	8468	58	92	2	1.09	146	273	.....	"
†12	26	1"-2"-3"-4"	3019	18 $\frac{1}{2}$	25	2	0.83	162	.....	.....	"

§By counting on one branch and multiplying the result, it was determined that an Elberta peach tree in north orchard, four years of age, bore 24,000 leaves. Six trees would have consequently, 144,000 leaves. Upon six trees in row 10, unsprayed, there were found 3,177 curled leaves, or 2.21 per cent. These figures show a prevention of 94 per cent. of leaf curl. This is slightly less than that in rows 9-10 and 15-16 of south orchard.

*Pustular spot, (*Helminthosporium carpophilum* Thum.).

†In 6, 10 and 12 the first and second pickings were not counted.

NORTH ORCHARD.

No. row.	No. trees.	Treatments received.	No. p'ches.	Yield bushels.	‡No. scabby.	Per C. scabby.	No. rotten.	Foliage.	Age of trees.
8	20	2''-3''-4''	2075	12½	82	3.94	18	.....	4 yrs.
14	19	1''-2''	1738	12½	430	24.74	34	.....	"
13w	16	1''-3''-4''	2842	} 16½	78	2.75	17	.....	"
13e	7	1''-2''	223		24	11.00	3	.....	"
10	28	Untreated	2600	18	351	13.12	37	Prime	"
11	28	1''-2''-3''-4''	2017	13½	87	4.31	29	.....	.....

ON SALWAYS—NORTH ORCHARD.

No. row.	Treatments received.	No. peaches	Yield—bushels.	‡No. scabby	No. badly scabbed	Per cents to 1 scab	Badly scabbed	Age of trees.
3	Untreated	2611	9½	1855	865	71.04	32.90	14 years
8	"	1847	7	1250	395	70.00	21.50	"
11	"	2196	7½	1377	485	62.70	18.90	"
4	1''-2''-3''-4''	1594	6½	626	47	39.30	2.95	"
6	2''-3''-4''	2406	8½	1726	1010	71.70	42.00	"
10	2''-3''-4''	3642	9½	2558	1348	70.24	37.00	"

‡Scab, (*Cladosporium*.)

SALWAYS—SOUTH ORCHARD.

35	2''-3''-4''	5478	.....	1230	486	22.45	8.90	7 years
36	Untreated	3393	.....	1230	608	36.25	17.80	"

This shows no unfavorable effect of spraying upon the yield and size of the Elberta peaches; while the pustular spot, prevailing in the south orchard was reduced from 16 per cent. to 1 per cent. or 94 per cent prevention. The spray caused a dropping of the leaves on the trees to such an extent that the fruit was better exposed to the sun and better colored, without unfavorable results as to yield and size. In 1895 slight leaf dropping resulted as compared with 1896. Attention has been turned to the difference in weather conditions to explain this.

It will be seen that in the old Salway trees, where the scab prevailed for some years previously, this season's spraying has not reduced the number of scabby peaches, nor abated the severity, but that in rows 4 and 5, which were four times treated in both 1895 and 1896, the scab has been reduced in both prevalence and severity. The figures here for row 4 are 40 per cent. scabbed on sprayed two years, with 3 per cent. of the peaches badly spotted, or cracked in these generally. While the untreated row 3, adjacent, gave 71 per cent. scabby peaches and 33.5 per cent. of the whole badly spotted and cracked.

On the Elberta variety of four year trees the scab mitigation was satisfactory from one season's treatment, as in the younger Salways of the south orchard.

The loss of foliage from the spraying was about the same in amount on row 6 of Elbertas (seven and eight years old), sprayed the second time only, as on the rows sprayed the third and fourth time, or one, two, three and four times. This second spraying on row 6 was made May 11th. This appeared to be the period of maximum injury to foliage, as to later treatments, with the same mixture, made on rows 3 and 4, and two more additional sprayings on rows 7 and 8, besides that one on row 6, produced no apparent additional leaf injury or dropping of foliage.

It is to be noted, also, that the spraying of 1895 produced practically no leaf injury. We conclude, therefore, that it is safe to spray peach trees with the seventy-five gallon formula of Bordeaux mixture, or solution of four pounds of copper sulphate, to fifty gallons of water, *before the buds open*, to be followed with *half the strength* of Bordeaux mixture after the calyx has fallen, and later at intervals of two weeks. The copper sulphate solution not to be used after trees are in leaf.

With postular spot and leaf curl prevalent, these are prevented by spraying, at least by a second season's work, for the curl. In the season of 1896 the ledger balance, for spraying, was upon the right side, but the margin was small.

Professor Selby (continuing): I might say further in regard to the pustular spot, which has so far as I know, been disfiguring the peaches in Ohio for only two years, we found that untreated trees had about 16 per cent. of the peaches spotted. It varied from $16\frac{3}{4}$ to $17\frac{1}{4}$. That where we made the third and fourth application of spraying this per cent. was reduced to four—spraying after the foliage had come out in full. Where we made the second, third and fourth applications this per cent. was reduced to one. Where we made the second application it was reduced to six and one-half; where we made the second and fourth, to two and one-half, and where we made all four applications the per cent. of spotted peaches was reduced to one. So you will see, so far as the pustular spot is concerned, the second, third and fourth spraying or sprayings, after the blossoms have dropped, is just as good as the four.

In Elberta trees, four years of age, affected with the scab rather than with the pustular spot, (very little if any pustular spot) we found that there was on untreated rows about 12 per cent. to 13 per cent. of scabby peaches. That where we made the first, third and fourth application this was reduced to $2\frac{3}{4}$ per cent., and where we made the second, third and fourth application it was reduced to 4 per cent.

In spraying for scab on old Salway trees the results to me are very surprising, bearing in mind the conditions this year. The amount of black-sided peaches in Ohio was certainly as large as it ever has been before. The scab prevailed to an enormous extent, and the loss in unmarketable fruit was somewhat serious.

Now, in these trees, twelve years old, that have been affected with scab seriously for some time, we found that the untreated rows gave about 70 per cent. All were spotted, and about 20 per cent. to 25 per cent. were badly spotted. Where we gave treatments last year, followed

by treatment this year, four sprayings, the per cent. of scab was reduced to 40; of badly spotted the per cent. was reduced from 25 to a, and the total per cent. of scabby peaches was reduced from 70 to 40, but no effect was received from the present season's spraying where not sprayed the year before.

In regard to spraying peaches, I perhaps ought to say something as to the methods of reducing the expense. We used a wagon tank belonging to Mr. Miller, holding some three barrels of mixture, and we make a stock solution of copper sulphate, made up one pound to the gallon, and instead of waiting to dissolve our copper sulphate each time, this was dipped out ready for use. This is a great advantage in making headway, and we slacked the lime in a narrow trough of several feet in length, and took out the proportion of lime in this way without waiting for slacking each barrel. It has been our experience that the largest loss of time comes at filling the tank.

Mr. Ford: I wish to ask if you strain your lime?

Professor Selby: Certainly; strain the whole mixture as it is put in the barrel.

Mr. Ford: What is the effect if you slack the lime and use it after it settles?

Professor Selby: The milk of lime?

Mr. Ford. Yes.

Professor Selby: That has been tried, but the result is a little more difficult to reach, because we would have to use a test probably to determine the reaction, and the chances, as determined from practical experience, seem to indicate the greater liability to injury. We do not regard the ferro-cyanide test as practically reliable and cannot use any other test if we use milk of lime or lime water. But we stir it up in the tub and use all of the white milk of lime except that which fails to pass through the sieve.

Secretary Farnsworth: Before we get interested in this discussion it has occurred to me, in view of the great amount of literature on spraying that it would be advisable for this society to request Professor Green, Professor Webster and Professor Selby to formulate a bulletin, giving the time most suitable for applications on the different trees, and varieties, the number of applications, formulas, etc., to be published in our next report. We all have an immense amount of literature on spraying, but when we find that the fungi have come upon us, the time has come to spray and we haven't time to look up that literature and digest it. Now, I know I am laying out a pretty big task for them, but I know they are seeking to do all they can for this state, and this is one of the subjects on which we need more information. The matter was suggested to my mind by a conversation with Professor Webster a short time ago, and I believe it is one of the most practical things that we can incorporate in our report. I make this as a motion,

Seconded by Mr. Albaugh. Motion carried.

Professor Selby: Is there an expression of opinion as to what would be the most useful form? As a folder that can be placed in the fruit house, or tabulations in the report?

The President: I should say something I could handle; could put in my packing house and look at a glance.

Professor Webster: There is another point. A great many would like to have a number of them to put in packing houses and they would want them printed on more substantial paper.

Mr. Ford: If this bulletin is to be published in a form separate why can't we have it pretty soon?

Mr. S. R. Moore: I regret that I have to leave, and I am very anxious to hear something from Mr. Willard and others; but I want to say to the horticultural people here to-day, if you happen to come through our county (Muskingum) and stop off at Zanesville, we would be glad to have you with us, and if you happen there when our horticultural society meets we would be glad to have you meet with us.

The President: The question of peach culture has been pretty well opened up. Is there any other discussion?

Mr. Albaugh: I do not want to get into a lengthy discussion, but I consider the papers read here upon the peach culture this forenoon, as the most exhaustive we have had in that line since I have been a member of the society, and that probably give us the nearest to the correct idea. In Mr. Miller's paper he told us how we ought to have low-headed trees. Head them back, and keep them within bounds so we would not need to use many ladders. In 1895, for one of our large southern orchards with 100,000 trees, I had ordered about 100 ladders before I saw the orchard in bearing, but our manager declined to have them made, and we picked 100,000 crates off of our trees by standing upon the ground, and every peach was picked on those five-year-old trees without a ladder, step or anything else of that kind. This year with six-year-old trees I again ordered some ladders, and got a dozen, but they are in our packing houses; not one was used, and every peach was picked from the trees, from the ground. We had nearly the same experience that the man had in growing the crop of corn. He said the ears were so high that when he turned in the hogs they had to get down on their knees to reach the ear, and we had to get down to reach the peaches.

There is another point I want to impress upon all the peach growers' minds. If you expect to have your peaches true to variety you must bud from foundation stock some every year, and I believe we ought not to bud longer than two or three years from that foundation stock.

In spraying we have a good deal to contend with in our southern orchards, and here, where the land is not heavy, surely in the sandier soils of Northern Ohio, we have a great deal of difficulty with the curculio,

and to get rid of the curculio is quite a job. Our little "nutmegger," Mr. Hale, this year pounded his trees for the curculio, and caught them in semi-circular sheets with a bow attached around the outside, and two American citizens of African descent with clubs, around the ends of which had been fastened rubber bands, pounded the trees, and with a vessel to put the curculio in at the end of the row, they continued from the first of the season up until the first peaches began to ripen, and Mr. Hale told me he had spent on his orchard—about 100,000 trees—at least fifteen hundred dollars in cash in catching curculios, and was not satisfied exactly that he got his money back, or any large part of it this year. He hopes he may get it back next year. I have a letter from George H. Moody, who has an orchard of plums and peaches and other stone fruits, in which he recommends a solution of lime water as a spray for use on peach trees to prevent attacks of curculio. Some of our professors ought to know whether lime water or the milk of lime will be injurious to the foliage. Of course in the sandy soils of Southern and Northern Ohio there is more danger of curculio than in the heavy clay land.

I am of the opinion that a moderate crop of peaches, with suitable care in the preservation of the fertility of the soil, can be grown successive years, but it does not follow that a heavy crop of peaches one year will deprive those trees of having a good crop the succeeding year, although there are some varieties that bear in alternate years.

Professor Green: I think that the problem of spraying peaches has been reduced somewhat. We have certainly succeeded very well on that line, but with regard to spraying for curculio we are still back where we started. I tried for several years to see if I could do anything with curculio with Paris green, and I found it could not be used on peach trees, and I am sure I do not know what we can do on that line except jarring.

It seems to me that there is one point that ought to be touched upon here and I wonder it has not been discussed. Now, both of the essayists on peach culture spoke of cultivation, but how are you going to cultivate on these hill lands? We hear that question asked again and again, and I should like to have Mr. Miller or Taylor or somebody else tell how it can be done here. I am sure the Athens county people are anxious to know. I believe that they will agree that it is useful and essential, and yet they don't know how to do it without having the continual washing.

Mr. Albaugh: I would suggest that you take the plan of the Southern fellows in planting cotton. They follow the slope of the hill around. It may be as winding as a snake, and the next row follows up, until it has got to be a parable that a mule brought up in the South isn't able to draw a straight line. Now, it seems to me if I were planting an orchard on these hills, I would commence at the top of the hill and follow the hill around as nearly level as I could, and you would not have any-

thing like the wash you would have if you attempted to plant with the incline up and down.

Mr. Shirer: How about the slopes two miles long?

Mr. Albaugh: I don't believe that Mr. Shirer exactly understands me. If there is a slope here, if it is not regular, I shall plow so that the cultivation will be comparatively level and not up and down the hill, so that if the roof of this building comes together at the comb and I was planting there, why instead of planting up and down, I would plant suiting the contour of the hill; I would follow the course of the hill so that the cultivation would come as nearly level as possible.

Mr. Shirer: It is splendid in theory, but might be a poor thing in practice. I got left in trying to raise nutmegs on that kind of a hill.

Mr. Brawley: If there is anything that the Athens county orchardists would like to know it is as to the the preservation of the hill-sides and their cultivation. With regard to cultivation I will say that you take such rains as we had in June and July, and if you go parallel with the hill the water goes right across them, and so far as we know we have no way to cultivate and preserve the land. But if there is anyone here who can tell us how we can keep the land on those hill-sides we would be very well repaid for our time spent at this meeting.

Mr. Woodard: I am a good deal interested in this discussion, because I have a peach orchard of 400 trees. The top of the hill is level, but the side is sloping toward the north. The rows are planted east and west. I don't pretend to cultivate up and down the hill. The best I can do the water breaks over and washes, especially that has been true this season. One of my neighbors was at my house this summer, and he suggested plowing the orchard and sowing it in oats and letting them grow about eight or ten inches high and sowing it to rye. How would that work?

Professor Taylor: One of the best plans to prevent the washing of hill-side land that I have seen practiced, is that mentioned by Mr. Albaugh. In the cotton fields of the Piedmont section of the Atlantic slope the horizontal method of plowing is followed, and on the steeper slopes rough terraces are made by throwing up back furrows or leaving narrow strips of land unplowed at frequent intervals. A similar practice in peach orchards is suggested. On any land subject to washing care should be taken that the furrow marks, either of plow, cultivator or harrow, should be left nearly horizontal, and not up and down the slopes. Even on the more gentle slopes washing often begins after cultivation in the summer where it could be prevented. A rain that would not cause bad washing will often start a small gully down the side, if the cultivation has been up the hill. Now, this is on gentle slopes, and I believe that when a field is left on the side hill after cultivation, the plow marks should be along the slopes. This is practiced in corn and cotton cultiva-

tion. While it disfigures your orchard somewhat in appearance I think it would be practical.

Mr. Ford: We have a peach orchard that is on a hill side. It slopes up both ways. The soil is sandy and we are troubled about this washing. Now the question is, what are we going to do with the water? There is a large amount of water that falls on twenty-five acres of land, and we have in one or two places large gutters washed up and down the hill. We could plow our land to throw it in small streams onto our neighbor, but that is not right. But we have got to do something with the water. The water is going to run down hill and make a great big gutter. If it runs in several streams we would have several gutters. I have made up my mind to plow in such a way as to bring the water where the gutters are already made, and to pave it with stone that we can pick up and to run the water down the hill. You can plow so as to keep your soil up the hill, and I can see no other way that we can get rid of the water. Now it goes into the road instead of onto my neighbor's land. That is the best way that I can think of to get out of the muddle.

Mr. Aultfather: That is a question I have been asking for several years, and it has never been satisfactorily answered.

Mr. Albaugh: The plan that Mr. Ford suggests is the plan that is followed in the South. They let the water go down to one of these places and let it go down the hill, and they throw in branches of pine in the absence of stone. They throw in brush to prevent a deep gutter from being washed. You must get rid of the water. You cannot evaporate it. You cannot soak it all into the ground. You have got to get rid of the continued heavy rains. They plow up a little ridge and make a levee and the water runs down and catches the levee and runs down to the depression, and when they take it far enough ahead they let it go down the gulley.

A Member: I have never found a hill on which I could not stop the wash with a good side-hill plow. For instance, on a side-hill where the wash was commenced, I helped a man fix one that was eight feet deep. We commenced in the first place above where the break was and run a furrow each way, just so the water would run gently, then go down ten feet and run another and then run them along each side of the wash so the water would follow these furrows. The water that washes the land generally is the water that comes from the accumulation above. It is very seldom that we have a rainfall that is sufficient to wash the land. It is accumulation, and the water gets a force and breaks over and washes the land away. My suggestion would be not to cultivate it square with the hill but to have it a little descending from the highest point. If you can get the rainfall distributed over the ground and carried out over the land you will cure your washing.

Professor Lazenby: Mr. Miller refers to his soil as clay, and yet, if I understand him correctly, he recommends fall plowing. Now, we have

found some difficulty in our land, in the clay, in fall plowing, where we plowed the ground before being much harder in the spring than where it was left. I want to ask Mr. Miller if his ground is heavy clay.

Mr. Miller: Part of it is very heavy clay. It was not my intention to recommend fall plowing except in an orchard for first planting. While many of our growers believe in plowing orchards in the fall, I do not believe it is a good practice.

Mr. Woodard: There is another question that I would like to ask Mr. Miller. I would like to ask whether he sold his peaches outright or whether they were consigned.

The President: That is a question on the program a little later and we will defer that now.

Mr. Vandeman: I noticed what our friend, Mr. Albaugh said about the success of Mr. Hale this year in regard to catching curculio in his Georgia orchards. He spent exactly \$2,000 in doing it. He had the little frames made as Mr. Albaugh has stated to you, of a semi-circular character; made from wagon bows for covered wagons, and he tacked on one side a strip about two and one-half inches wide and as light as they could have it, and they tacked muslin on this semi-circular frame, and two hands took a row, each having one of these semi-circular frames and they hurriedly went right up and the two halves encircled the tree, and they had clubs with rubber bicycle tires cut in pieces and tied on the clubs so as to prevent injury to the trees, and they hit the limbs with these clubs and hustled right through the row catching all the curculio in the row, and at the end of the block they had a receptacle in which they dumped the contents of their catchers, and he told me that they had made an immense success of it and that he cleared a number of thousands of dollars in that operation.

Mr. Albaugh: I will say that we believe in catching the curculio, but our southern manager didn't believe in it. We spent \$50 in getting the same kind of sheets made and tried it three or four days and our superintendent said they were not getting enough bugs to pay for the pounding. Mr. Hale said to me, "I believe I will get some results hereafter." Mr. Hale had some more peaches than we had. He had the Crosbys and the Stump outside of his Elbertas. All of those are somewhat hardy in bud and had a crop this year. We had some of the same kind, but only had a few crates, and he had 40,000 or 50,000.

The President: We have a brief report now by Professor Lazenby.

Mr. President and Members of the Ohio Horticultural Society:

Your committee appointed in accordance with a resolution adopted at the State Fair meeting, have fully considered the subject referred to them and have the honor to present the following brief report:

Recognizing the fact that prompt publication of the proceedings of the annual and sectional meetings will add greatly to their interest and value, and finding it impracticable to depend upon the State printer for said promptness, we recommend

that the Secretary be authorized to reduce the size of the report to about two hundred pages, and have the same published at the expense of the Society at the earliest possible moment.

We believe that an economical administration of the funds of the Society, including the reduction of stenographic work, and greater care in the allowance of expenses of standing committees and others who render no adequate equivalent for this demand upon the treasury, will enable the Society to meet the additional expense.

We urge the adoption of the proposed change all the more strongly because we have the assurance of Secretary Miller of the State Board of Agriculture, that our proceedings, although published by the Society, will be republished in the annual report of the State Board.

We recommend that the proposed sectional meetings of the Society be held not later than February, in which case a summary of the proceedings can be incorporated in the annual report.

WILLIAM R. LAZENBY,
N. OHMER,
W. W. FARNSWORTH.

On motion of Mr. Woodard, the report by Professor Lazenby was unanimously adopted.

The President: I wish to announce the committee to audit the treasurer's account, which it would be advisable for them to do during the noon hour. It is as follows: J. S. Hine, C. C. Sterling and Professor Selby.

And thereupon, on motion, a recess was taken until 1:30 P. M.

AFTERNOON SESSION.

THURSDAY, December 3.

The afternoon session of the Convention was called to order by the President at 1:30 o'clock as per adjournment. The President then announced that the question box would be first upon the program, and requested the Secretary to read the questions.

Question: Is there enough feeding value in apples to pay for the labor of gathering and storing?

Mr. Shirer: I might answer that question. Is there enough food in apples for the people to buy them? I mean, is there enough nutriment in apples for people to buy them, if there is not enough to feed the stock?

The President: I never thought very much about the nutriment that there is in apples when I ate one.

Mr. Livingston: There is more in sweet than in sour apples.

The Secretary: I should say yes, if you don't have to go too far to gather them.

A Member of the Muskingum County Society: A member of our society has a horse that he keeps on apples. He has fed him all fall on

apples and he is in good condition. I know they are good for cows and pigs, but as Mr. Livingston said, the sweet apples are better than the sour apples

Mr. Whitney: I should say that farmers who do nearly all their own work could pick up the apples and feed them to the horses, but where the labor has to be paid for I don't believe it would pay. I would not do it.

A Member: I am of the opinion that there is not much food quality in sour apples, but we have fed Golden Sweets to our horses when we were working them. We used a little bran with it and they kept in good order.

Question: Did you feed corn?

Answer: We fed no corn to them, but bran and sweet apples, and they kept in good condition.

Mr. Aultfather: I have to buy all the food for my own stock, and I had to pay five cents a bushel for apples and haul them home and feed them out to my horses and cattle.

Question: Should a Baldwin orchard of two hundred trees be planted or grafted with other varieties for the purpose of fertilization?

The Secretary: That is very similar in import to a question on the program—question 8. "Is it necessary to plant more than one variety, etc."

The President: We will leave that question for the present.

The Secretary: I would like to hear from Mr. Willard on that. (Mr. Willard is not present.)

Question: Can there be a plan devised in the sale of our grapes that will encourage the growing of the best quality at the sacrifice of quantity, so that the growers of the best fruit can realize a fair remuneration for their efforts in that direction?

Secretary Farnsworth: Possibly I had better read all three of these questions; they are all in the same line.

Question: Is it not a bad policy for those who manage the sale of our grapes to urge or even allow the picking and shipping of large quantities of unripe fruit, while there is but a slight demand in the market for good fruit?

Question: While it is claimed that there is an overproduction of grapes, would it not be wise on the part of growers to diminish the quantity and thereby improve the quality and help to increase the demand?

The President: Mr. Woodard is one of our chief grape men, I will call upon him to answer these questions.

Mr. Woodard: Mr. President, I would say it is the right thing for us to do, to raise better grapes, better in quality and less in quantity, though really this is a hard thing to do. It is hard to make growers of grapes realize that this is the way to do. With us, we have had an immense crop of grapes and they have been sold at low prices, and I think

the reason is that some were shipped early in the season unripe. We do not want any grapes placed upon our market that are not ripe.

The President: How about shipping grapes before they are ripe, when there is no demand for even ripe grapes to amount to anything?

Mr. Woodard: I think that point needs to be guarded against. It is unadvisable to consign two or three car loads of grapes into a town where there is no demand for them, and when even the dealers themselves do not advise shipment. In large towns it works much the same as with the watermelons that were spoken of this morning. If a person is going home from his work and buys a basket of grapes and it proves to be sour he is going to wait some time before he buys a second basket, whereas, if the grapes were in a good eatable condition he would soon buy again. But one or two baskets of green grapes in a family will supply their need for some time. I don't believe in putting upon our markets unripe grapes. That has been done this year, but the results were unsatisfactory.

Mr. Shirer: I don't know about grapes, but I do know what some of the sinners did down our way, who don't believe that the "love of money is the root of all evil." I mean in regard to the nutmeg trade, by shipping two weeks before ripe. The result is, they come to the market in big shipments to the northern towns, and just as Mr. Woodard says, they don't buy the second time, and the result is a glutted market afterwards. Now, if you will just wait on nutmegs two weeks longer and then sell for all there is in it, you will hold the market. People are all in too much of a hurry.

The President: We will now listen to a paper by Mr. G. K. Campbell, on the subject, "Should the Overstocked Market for Fruit Discourage Further Planting?"

The natural bent of the average American mind is, "If he sees a good thing, he goes for it, and works it for all there is in it," making but little difference as to what the business is. For this reason we often find an overproduction of the article in question, whether it be in commercial, agricultural, horticultural or any other line of business. A glut in the market of any one commodity has a tendency to drive many out of *that* line of business and into some new venture that promises an early fortune. Staying qualities are very necessary in the make up of the man who succeeds in any enterprise.

The broad field of horticulture presents so many inducements to enter her domain that many enlist without the necessary qualifications, and when the first shadow of adversity or discouragement appears, they drop out, and those who stick reap the successful harvest. Our country is a large country, and has a varied soil and climate. Our ability, in case of a general crop of any one kind, whether cereal, fruit or vegetable, would nearly supply the whole world. A wise Providence has so nicely arranged our climatic conditions that when one section has an overproduction another section has a dearth of the same article, and our interstate commerce carries the surplus hither and you and all are supplied, and none denied.

Last year this section of Ohio never witnessed so large a crop of apples, but they all found a ready market at remunerative prices within the bounds of our own country, as many sections had a scarcity, and we supplied them. In 1896, while we of

Southeastern Ohio have but few apples, there are thirteen states which have 90 per cent. or more, of a full average, and the result is, apples are shipped to us and sold at reasonable prices. So it has been with the peach crop, especially in Athens county. Not having the statistics before me, I venture the assertion, without fear of successful contradiction, that more money has been brought into Athens county as returns for its fruit than from any other industry during the past two years. This industry is but in its infancy, its future is bright and encouraging. Our apples are finding their way into foreign markets, and compare favorably with any in the world. Our ocean steamers are now carrying our apples to foreign ports at reasonable rates, and if our interstate commerce laws could be properly adjusted so as to enable the producer to ship from *any* point on railway lines direct to his shipping agent at the seaport, without discrimination, we would still realize better prices for our surplus when we had one.

As for our peaches, we are obliged to look for our home markets to take what we have to sell, being of a perishable nature, and will not bear shipping abroad. What is true of peaches, is also true of all other fruits, except apples, in regard to markets. The home markets must take them all.

Horticulture is so varied, and it so happily adjusts itself on account of climatic reasons, that as a rule there is never an abundant crop of *every* kind of fruit in any one year. While there's crops of some kinds there is a shortage in some other, and must be supplied from some *other* locality, hence the necessity of varieties of fruits. This section of Ohio is peculiarly adapted, owing to topographical reasons, to but two important industries, viz.: Horticulture and sheep raising. The latter, from reasons well known to all, has become well nigh extinct, but the former has been able to protect itself from ravages of a similar kind. Our hilly country affords thousands of acres which are better adapted to fruit raising than anything else, and much of this is lying idle, and should be utilized by the fruitgrower. Another reason why we should continue to plant fruit is, our population is rapidly increasing, and as fruit has become an indispensable article of diet, and is found, not only on the tables of the rich, but on the tables of every class as well, more fruit instead of less will be required to supply the demand. Eternal vigilance is the price of liberty, as is also the price of a crop of fruit. Fruit of every variety has its numerous enemies, against which the fruit grower is compelled to wage an unceasing warfare, or his labor is for naught. But can we say our fruits are beset by a greater number of enemies than that of our cereal or vegetable crop? I trow not. While vigilance and care are required in the orchard, the labor is not so heavy in its character as that found in the process of production of cereal or vegetable crops, and in fact the labor in the field of horticulture is of a more interesting and instructive character than is found in almost any other industry. The humble cottager with his small plat of ground, although he may not be able-bodied, yet he may cultivate his patch of small fruits, thereby supplying his own wants, and possibly his local market, while the more fortunate and extensive grower ships his surplus to the city market. Horticulture in its varied lines is a delightful subject on which to work. To watch and become familiar with the nature and habits of each tree, plant, shrub or flower, gives not only exercise to the body, but food for the mind. A reasonable amount of intelligence is required in the make-up of a successful horticulturist. Fruit of all kinds adapted to our soil and climate, require close attention and cultivation. The day of non-culture of the orchard is a thing of the past. With proper planting and cultivation, an orchard is now brought into bearing in about one-half the time required in the days of our fathers. They had the advantage of us in having the new and fertile soil, containing the elements that we *now* are obliged to supply. We live in a fast age; even Nature herself is compelled to respond to the forcing process, through the agency of stimulating plant food and high cultivation.

The intelligent orchardist, who plants and cultivates intelligently, may reasonably expect a crop of fruit in from four to eight years from date of planting, according

to variety, besides an annual paying crop of something else. Until the trees are large enough to shade most of the ground, corn, beans, potatoes, or any other hold crop may be profitably grown in the peach, apple or plum orchard. Manipulation of the soil is the most important factor in the tree's growth.

Fruit growers should profit by the sad experience of those who have heretofore ignored home and patronized foreign nurseries. The fruit tree agent, with his smooth and oily tongue, and his beautiful pictures of imaginary fruits, has reaped a rich harvest from the credulity of the people. It might be said with some degree of truth, that his vocation began in the early history of the world, as recorded in Genesis 3-6. Patronize home nurseries, that you may know what you are getting, without having to wait a series of years, to find out at last, that you have been humbugged.

Contemplating planting an orchard, you should know what varieties are profitable in your vicinity, and be content to *only* grow such, and experiment in a small way with those varieties so highly recommended by some foreign nurserymen. Many peach growers in my neighborhood have been imposed on by inducements to plant largely of the Alexander variety, which has proven almost worthless there, although it may do well elsewhere. I would suggest that every neighborhood have its own nursery, and grow their own trees, which can be done at a much less expense, and thereby save much worry, and possibly much profanity, at fruiting time.

I would not consign the tree agent to the realm where the mercury never falls below 112 degrees, but will do him the justice in saying, doubtless at one time he served a good purpose in inspiring the people with a desire to grow more and better fruit. The mission of the foreign tree agent is ended in this part of the country, but the agent of the home nursery is a public benefactor. While grafting and budding are so simple in their mechanical execution that the only wonder is, why every fruit grower is not his own nurseryman; but that would not be practicable even were it desirable. Better patronize your neighbor who makes nurserying a specialty and you will get better results. We should be encouraged to plant more fruit. Our waste places should be made to bring forth an abundance of fruit, instead of the unsightly copse of briars and thorns furnishing harbors for destructive vermin, as are found in so many places. In *no* other way can we so easily enhance the value of our property as by having it well stocked by good fruit.

In what other calling in life can we blend so much satisfaction and pleasure as in fruit growing! What can be more heaven-inspiring than the sweet fragrance wafted on the breeze, in the early spring, from the blooming orchards of the enthusiastic fruit grower's home, or to look upon the scene in autumn, when the trees are laden with golden fruit! The man that can passively look upon such scenes unmoved, is certainly destitute of those finer feelings God intended to dwell in the human soul.

The President: Gentlemen, the question and paper just read are before you for discussion. Should the overstocked markets for fruit discourage further planting? It is quite an important question. One probably that every horticulturist is asking himself.

Mr. Whitney: I would like to offer a few remarks, particularly about the low prices of grapes talked about before the paper was read. I might offer some suggestions that were not advanced as to the causes of low prices of grapes, and entirely different from those spoken of. It was suggested that picking and marketing green grapes had much to do with deterring people from buying them. I do not think that this year that had anything to do with it, and I want to give my opinion from experience in selling fruit and vegetables through the whole season. In the

first place there was an overproduction of grapes, considering the condition of other things pertaining to them, that is, the condition under which they must be marketed. If our conditions had been different there would have been no overproduction. In the first place there was a great crop of all other kinds of fruit and the grapes came almost last, and the people had been stuffing themselves with nice fruit all the season, and by the time the grapes came into the market they were not caring particularly about more fruit. Raspberries had retailed for \$1.50 a bushel, and blackberries the same, and the housewives had canned so many that they cared little for grapes.

Then another great reason was the lack of a little cash down in the bottom of the pocket, and the reason for that was the fact that the working men had been almost or entirely idle throughout the greater part of the summer, and by that time there was but little cash to buy with. And then again, by the time the grape crop came on the campaign was so exciting that most of the people had almost forgotten to eat, and if they had a little money to spend they expended it for campaign uniforms, excursions to Canton, etc. My observations show just this fact, that last fall when the grapes were shipped into Warren, the grocers would unload 100 baskets of grapes there every day. Go there the next day and they were gone and they were piling up another 100 baskets, and the price was better than this year. This year you would see them take from ten to twenty baskets at a time, and if you would go back a week hence you might find them all there yet. The reason is that the people could not or would not buy fruit this year. They had not the money to pay for it; then they were excited and didn't stop to eat. With other conditions there might not have been an overproduction. These conditions might not in another year be so unfavorable again. I do not grow grapes myself, but I see them sold, and I can see the reasons for this condition. I take it that other towns are not much different from our town in respect to buying, seasons, etc.

The President: Is there any further discussion on the subject or paper?

Mr. Longenecker: I doubt whether with the large amount of grapes grown and the way they have of marketing them, it could advance the price of the grapes upon the market in that way very materially. If any of us get better prices for our grapes it is those who are nearer the market and put them into the hands of special customers. I am enabled to obtain a pretty fair price for grapes compared with the prices of those that are shipped in or put upon the market in the ordinary way, but I am frank to say that if I had a very large amount to put upon the market I do not believe I could get out unless I made an unusual effort. My average price this year for grapes was about three and one-half cents per pound, and it was hard work to sell them at that this year, but I sold them a few years ago at from six to seven cents a pound. Of course

these grapes were choice, yet I have an idea that some grapes that are grown in vineyards were put up almost as choice as mine were. Our markets are filled with grapes shipped from the lakes, yet at the same time those grapes were sold at one and one-half cents a pound and sometimes a little less, I was receiving three and one-half cents a pound and sometimes four cents, but it was taking some work to do it.

• Mr. Shirer: This is really a very important question. How would it do if we would go back and call in the old year of jubilee? That is, not plant or sow any the fiftieth year? We have been robbing the soil for a great many years. Now, let's give it a chance to rest and start out new. Then the people would be good and hungry. I honestly believe that complete glutting of the market will be the result in the future. Now, I am no pessimist, Friend Albaugh. I was born in the sign of *Contentment*, but conditions have so changed that glutted markets will be the only markets we will have as a rule. There may be exceptions. I do not intend to go back and raise a thousand bushels of strawberries and get nothing out of them. I do not know whether I intend to raise as many nutmegs as usual. It don't pay to ship any more. What are we going to do? Just plant enough to retail and leave the balance spoil I suppose. Now, I honestly believe it would be a good policy if we would all plant a little less and haul a little less manure from town and reduce expenses. And now, another thing. The fruit growers really have been working for the express companies for the last few years. The express companies and the railroad companies have never come down a cent. They are getting their full profit. I think we ought to quit working for the railroad and work for our own interests, and just raise about enough to have a good retail market and have a few left, so that if the hungry folks pay enough and want something we will send it to them, provided they say how much they are going to pay, but by all means, don't send on commission. You are very apt to pay the freight yourself. [Laughter.]

Mr. Longenecker: There are some of these suggestions that are valuable, not only in fruit growing, but along the line of other products. One is, that we shall all go to planting less. That is very good, but we cannot persuade the other fellows to do that while we just keep right on.

Mr. Livingston: I think the best thing we could do would be to ship good stuff. Now, there are a great many people I find, especially in Florida and in the other southern country, that just pile it on "topsy-turvy" and they get very little for it. Now, the commission man understands that very well and he has got to average that thing up or else the careless shipper will consider himself cheated and abused. He has got to balance it up or there is very little encouragement about selling good stuff. Now, I think the best lesson would be this: Classify our goods. Better throw away the tail end of the crop. Better by far feed the tomatoes to the cows. They will make good butter and plenty

of it. We find when the frost strikes our vines they will leave good corn and run over to the field to eat those tomatoes. They will make good butter, and it is of no use sending them. They won't pay the freight.

I don't like to hear so much complaint that a kind Providence has given us so much we don't know what to do with it. Everywhere I go I hear complaining that we have got too much and cannot get anything for it. It is a blessed thing we have got so much. The poor can have all they want to eat, and the farmer is the last one who ought to growl about it, because he has it at home. Let us look on the bright side of things and learn to live within our means. That is the great lesson of life, and when you learn that you are not in debt so much as you thought. The great trouble is, we have run into debt heel over head. We want to buy all the land that joins us. It is not the farm he lives on that he is in debt for, but the additional farm that the farmer has bought. He ought to get rid of it. There ought to be more people out of the city on the farm raising enough to eat for themselves.

Mr. Ford: The poor we always have with us. My friend Livingston says let the poor have the fruit, and so they can if they live under the tree. We pay the railroad charges for shipping to the cities because the poor have no money to pay the freight. That is the reason why there is not a larger consumption of fruit. Now, perhaps the larger part of the members of this society are not aware that with all the depression of the fruits and everything that the tiller of the soil grows, the railroad companies have advanced their rates on shipments about 16 per cent. That took effect in April last. So that the poor who might have our fruit at a reasonable price, have to pay more for railroad expenses than they do for the fruit itself.

Mr. Rutherford: The fruit-growers of Meigs county were blest with a good crop of peaches as well as a good crop of apples. We made it a point to grade our fruit a little the last year, and we have been selling to the retail dealers direct, leaving the commission man out, and with our A's and AA's we put a printed guarantee on every package and send them out to our retail trade and during the season of our best peaches we had more orders with good prices than we could fill. One of the best things we can do I think is to grade our goods and put a guarantee upon it and let the poor goods go for what they are worth.

President Cushman: The first committee to report is on the State Fair Premium List.

A Member: The committee is not ready to report.

The President: The next committee will be that on Constitution and By-Laws.

Upon motion the report of the committee on Constitution and By-Laws was adopted. (The Constitution as amended will be found in front part of this report.—SEC'Y.)

The President: There is more committee to report, that on Posting Fruit Lists at the State Fair, by Professor Green.

Professor Green: I don't know that I ought to make a report, because I forgot that it was my duty to say anything about it. Last year the matter was talked about of doing something to make the exhibit at the state fair more intelligible and I went away before the appointments were made, and I didn't know I had been appointed on the committee, but found out just before the fair time that Mr. Ohmer, Mr. Miller and myself were appointed at Dayton to do something in this matter. It was too late then to get together. Perhaps it was my fault, but I did not know we had the work to do, and neither did they. The only way to do then was by correspondence and there was not very much time for that, and after some little correspondence the only plan feasible seemed to be to make an exhibit of some of the leading varieties in such a manner that people could learn the names of the varieties and if possible something about them, and this was attempted and carried out in rather an incomplete manner with the assistance of quite a number of members of the state society and some who were not members. It would have been impossible to do it in any other way, and some did a great deal toward it by sending fruit. It was put on exhibition near the Experiment Station exhibit, and we had cards printed and put up in a manner so that the people going by could easily learn the names of the varieties.

For my part, I do not feel satisfied that it was done in the best way that it could be done, but it was a good start and I think a great many appreciated the effort at least, because I noticed a great many people looking over the grand collection of fruit turn away feeling a little disappointed because they could not learn the names of varieties very successfully, except when they could get hold of somebody like Mr. Farnsworth to stop and tell them what varieties were on exhibition; but when they could not do that, a good many times they turned away from that exhibit and came and looked over ours and learned the names of varieties they could not learn any other way. That is all I have to say on the subject. I feel very thankful to those members of the society and others who helped us in the matter.

Mr. Woodard: Have you any suggestion in regard to labeling the fruits?

Professor Green: The matter was talked over there among us how best to label the fruits, and we came to the conclusion that we could make a wire standard to hold a card up above the fruit. We thought we could have it down just above the apple and not have a very large card and not hide the fruit and it would look better, but as a whole we were not quite satisfied with the plans we had there. They could read the names well enough, but we concluded that they would not look well. We found another plan of having the card about as large as that

(indicating), not fastened into the apple, but fastened on a wire to support it.

The President: It seems to me that instead of the professor being obliged to those who helped him in this work, that we ought to be obliged to him for undertaking the work that he did, and it would seem advisable to me that we continue with something of this kind. What will you do with the report of the committee?

Mr. Rockhill: I move that the report of the committee be accepted and the committee continued.

Seconded by the Secretary. Motion carried.

Mr. Willard: I would like to ask the gentlemen whether in putting their cards on the fruit for exhibition purposes, if they have tried the pin?

Professor Green: The pin to stick to the fruit?

Mr. Willard: Yes, sir.

Professor Green: I have seen it, but haven't used it very much.

Mr. Willard: We have used it with a great deal of satisfaction. We have from seven to eight thousand plates of fruit every fall, but there are advantages and disadvantages in everything we use. The great trouble with the card put on some of the specimens of fruit is that if the fruit is small or highly colored the card covers it up. It is quite plain and can be read a long distance and can be used to advantage, certainly on plums and peaches. If you are not careful you cover them up having your card on the plate. These pins can be had very cheaply by the gross.

Professor Green: They were in use last year at the Fair, but the card standing above the fruit rather detracted from the general appearance. I forgot to say that some one ought to make some recommendation to get the Agricultural Society to provide means for having the whole fruit labeled in some manner. It can be done, and this committee could, if they would work on this line, see that it is all labeled.

The President: Also give the committee on Nomenclature a better chance to work.

Professor Green: Yes, sir.

Mr. Ohmer: The plan that Mr. Willard says is practiced in New York was practiced in Ohio some years ago. They have a bushel of those pins now. I have some of them at home. It is a wire curled on top so that you can stick a card in it. The objection to that is, that putting it in the apple you mar the apple.

Mr. Vandeman: There is one simple plan I have used with considerable satisfaction in labeling. It answers pretty well for the apple and quince and pear, but not so well for some of the other things, and that is, to have a list of the varieties made out that are likely to be exhibited, and to have four or five hundred copies of that list printed, and they can be cut up. Print the letters large enough to be easily read on

ordinary paper, and then give each exhibitor a set of these sheets and let them cut them up and paste them on. It works very nicely, but of course there are some objections to it. You can hardly place it on grapes at all.

Mr. Ohmer: That has always been practiced in this state, but has been discontinued for good reasons. I think the plan suggested by Professor Green is practicable, to have the name so placed that it can be seen by the people who pass by, and yet not raise it so as to spoil the view of the fruit. I believe this a very good suggestion.

Mr. Vandeman: I think on the whole that is the best. It is a little more costly. The cards would be very small and type very large. Not have a card display, but a fruit display.

Mr. Albaugh: The trouble with Mr. Vandeman's plan is, that every fellow that comes along will pick up the apple that has got the best label on it, and when he sets it down again the name is turned so nobody can read it. That is about the kind of a fellow that wants to get his hands on the fruit. And then the label may be pasted over worm holes to hide them.

The President: We don't want anybody to handle our fruit after it is fixed for exhibition, except the judges. And while this matter is all very interesting and necessary to solve, it is not taking the course that I expected it would from the recommendation I made which caused the appointment of the committee. Now, it is not altogether the names of the varieties we want. Suppose I come in here and I want to find a certain member of this Society and have to have him pointed out to me. Of course if he had his name on his coat here I could distinguish him by looking them over. Now, I cannot ask that apple what kind of a tree it grew on, and where it grew, and how productive, etc., the very things I wanted to know after I found out the name. Now, what I wanted to see this Society do was to undertake to tell in some way to the examiner of the fruit something about the value of that apple besides just for exhibition and for premium. The idea I had was to make these exhibits, if possible, so as to explain to the man that was making inquiry, that which he wanted to know. Now, what I would like, is to see this Society take some steps or devise some means to make the fruit exhibits intelligible to the ordinary observer.

Professor Green: We did that. On the fruit exhibited there in the Station we had on every card some remark concerning every variety. "Baldwin, Northern Ohio," "Rambo, Southern Ohio," just as many as we could get in small type. Then we had lists embodying the information, but we didn't attempt very much in that line.

The President: I am glad to hear what you have to say. It didn't appear in the remarks, and I was unable to attend the Fair.

Professor Green: I ought to have had a written report.

Mr. Longenecker: I will say that this list that Mr. Green made up was

used there, and I also saw that many persons interested in fruits, were carrying those lists away with them. It was a list made up after considerable careful study. I have looked over it and I want to compliment the committee on the work they did there; and further, that list has been copied into a number of our agricultural papers, and is going out over this state doing considerable good, I feel sure.

The President: Perhaps we better not spend any more time on the subject now. We will listen to the report of the Secretary.

SECRETARY'S REPORT.

Members and Friends of the Ohio State Horticultural Society:

It affords me great pleasure to be able to report that the year which has elapsed since our last annual meeting at Canton, has been one of the best in the history of this Society.

The February meeting at Dayton was fairly well attended, and many were no doubt kept away by the severity of the weather. The proceedings were fully up to the average in interest and practical value.

A large number of new county and local Horticultural Societies have been formed during the past eighteen months, and most of them are in a flourishing condition. The old societies are all doing excellent work as I know from occasional reports received from many of them.

It is my good fortune to have my institute work for this winter mainly in horticultural sections; being assigned to every county but one of the two northern tiers of counties between my home and the Pennsylvania line, and I shall (as I have in the past) endeavor to encourage the formation of new societies and greater usefulness in the old ones.

The number of members has largely increased, 83 new names having been added to our list, which now exceeds 200. By persistent work, in which the secretary was assisted by the vice president and treasurer, we secured a promise from the State Printer that our reports should be ready for us by April 1, providing the copy was ready by March 1. Promptly on March 1 it was expressed to him, but on one pretext and another, the work was delayed as usual (although not as much), so that instead of receiving reports April 1st, it was June before they were ready for distribution. Owing to the objection of the supervisor of public printing to so bulky a report, Secretary Miller was obliged to request me to condense our report to 150 or 175 pages. This request coming after the copy was in the hands of the printer and partly in type, made it rather difficult to condense. However, it must be done, and I secured Professor Lazenby as the most accessible member to help me bear the blame of omissions, and began using the blue pencil mercilessly, with the result that the report was abbreviated to 244 pages.

The committee on publication, consisting of the treasurer, vice president and secretary, met at Secretary Miller's office in October, and after consulting with him came to the conclusion that the proper method for us to pursue in the future, would be to publish our reports annually as soon as possible after the winter meetings, and condense them to about 200 pages.

The work of the ad interim committee has been unusually effective the past year, both in forming new societies and securing new members.

The demand for our reports is largely increasing, and I believe that when we have succeeded in holding a State Horticultural Meeting in each of the four quarters of our state each year, and publishing the reports thereof in time to reach the peo-

ple before the spring campaign opens, we will soon have the Ohio State Horticultural Society on a par with "Ohio men," and other Ohio institutions and products: "The best in the land."

The President: Certainly the Secretary's report as to the condition of the Society in membership and interest is very pleasing. What will you do with the report?

Mr. Albaugh: I move that it be excepted and printed in the minutes. Motion carried.

The President: We will now listen to the report of the Treasurer.

REPORT OF TREASURER.

N. OHMER, TREASURER.

In Account with the Ohio State Horticultural Society, Dr.

Date.	To whom paid.	Vouch ers.	Amount.
Dec. 5	C. L. Whitney for services rendered.....	1	\$ 7 05
5	John Flynn, " "	2	5 00
5	E. M. Buechley, " "	3	17 85
5	S. R. Moore, " "	4	9 90
5	J. D. Imley, " "	5	8 35
5	E. M. Woodard, " "	6	9 00
5	L. M. Bailey, " "	7	41 95
5	L. M. Webster, " "	8	2 60
5	N. H. Albaugh, " "	9	18 15
5	August D. Selby, " "	10	4 45
5	T. Towers, " "	11	9 70
5	W. R. Lazenby, " "	12	15 55
5	W. N. Scarff, " "	13	15 05
5	L. B. Pierce, " "	14	10 40
5	O. W. Aldrich, " "	15	11 50
5	E. H. Cushman, " "	16	8 20
5	W. W. Farnsworth, " "	17	156 90
5	H. H. Altfather, " "	18	9 15

REPORT OF TREASURER—Concluded.

Date.	To whom paid.	Vouch ers.	Amount.
Dec. 11	N. Ohmer, for services rendered.....	19	\$18 85
11	Wm. Miller " "	20	12 00
14	F. G. Withoft, " "	21	17 30
28	C. H. Waid, " "	22	12 30
31	Frank I. Brown, " "	23	78 60
1896.			
Feb. 20	E. M. Woodard, " "	25	33 70
20	W. W. Farnsworth, for services rendered	26	48 81
20	E. H. Cushman, " "	27	24 21
20	Frank Ford, " "	28	14 35
20	H. H. Altiather, " "	29	17 30
20	E. M. Buechley, " "	30	6 60
20	S. R. Moore, " "	31	13 60
20	C. W. Aldrich, " "	32	7 60
20	L. B. Pierce, " "	33	17 15
20	N. H. Albaugh, " "	34	5 00
20	W. N. Scarff, " "	35	7 00
29	C. H. Waid, " "	36	12 60
20	F. M. Webster, " "	37	6 90
20	W. R. Lazenby, " "	38	7 60
20	Wm. Miller, " "	39	16 75
Mar. 13	Frank I. Brown " "	40	72 05
Apr. 2	W. W. Farnsworth, " "	41	75 00
22	A. D. Selby, " "	42	7 34
July 3	W. W. Farnsworth, " "	43	116 75
3	J. L. Tranger, " "	44	106 75
Sept. 19	W. W. Farnsworth, " "	45	91 66
Oct. 22	N. Ohmer, " "	46	5 00
	Total		\$1,213 52

N. OHMER, TREASURER.

1895.	In account with the Ohio State Horticultural Society.	Cr.
Dec. 5	To balance in treasury.....	\$575 38
10	To warrant drawn on state treasury.....	312 05
11	Received from secretary, membership fees.....	106 00
1896.		
Jan. 2	Amount refunded by the secretary.....	10 50
Apr. 24	Warrant on state treasury.....	532 62
July 8	Warrant on state treasury.....	223 50
Sept. 24	Warrant on state treasury	91 66
		\$1,851 71
	Amount expended.....	1,213 52
	Balance in treasury	\$638 19

REPORT OF AUDITING COMMITTEE.

Your Committee have carefully examined the books and vouchers of the treasurer and find them correct.

J. S. HINE,
C. C. STERLING,
A. D. SELBY.

On motion of Mr. Albaugh, the report of Treasurer and also of Auditing Committee was accepted and ordered printed in the minutes.

The President : The next business in order will be the election of officers of this society. I believe it has been the custom now for one or two years to prepare ballots and cast them without nomination. I will appoint as tellers Mr. William Miller and Mr. E. M. Woodard. The first officer to be elected will be president.

And thereupon the following officers were elected :

President—Mr. E. H. Cushman, Euclid, Ohio.

Vice-President—Professor W. R. Lazenby, Columbus, Ohio.

Secretary—Mr. W. W. Farnsworth, Waterville, Ohio.

Treasurer—Mr. N. Ohmer Dayton Ohio.

AD INTERIM COMMITTEEMEN.

First district, Mr. C. H. Waid.

Second district, Mr. N. H. Albaugh.

Third district, Mr. Alfred Shirer.

Fourth district, Mr. Wm. Miller.

Fifth district, Mr. J. S. Hine.

Sixth district, Mr. E. G. Cox.

Seventh district, Mr. E. M. Woodard.

Eighth district, Mr. H. H. Altfather.

Ninth district, Mr. S. R. Moore.

Tenth district, Mr. Frank Ford.

The President : This is a good time to bring up any miscellaneous business.

Mr. Woodard : Last night a resolution was passed that a committee of three be appointed to consider the recommendations of our president; in his address last evening. You all know the modesty of our president I therefore nominate the following gentlemen as that committee: Professor Green, L. B. Pierce and N. Ohmer.

Unanimously adopted.

The President : We will now go on with the paper that is to be given us by Professor Webster.

SOME POINTS IN SPRAYING AND SPRAYING MACHINERY.

By F. M. WEBSTER, WOOSTER, OHIO.

The efficiency of spraying, as a protective measure, against both destructive insects and fungi, has long since been proven, and, hence passed the experimental state; but from the number of failures, more or less entire, that are each year reported, we must yet look upon it as a method, still somewhat crude and having yet to be developed to an art. Then, we have arsenical poisons, and arsenical poisons so called, in which the death dealing elements are more or less in proportion to the honesty of the manufacturer and the dealer. As a fruit grower cannot conveniently analyze his material, there is of necessity an unknown factor in the problem, and until there can be some standard of purity established and this standard protected

by law, the uncertainty consequent thereto will continue. There seems no good reason why insecticides and fungicides should not be branded to denote their value, for the purposes for which they are intended, precisely as in the case of kerosene or commercial fertilizers.

Success in spraying, as in almost anything else, depends not so much upon one or two great factors as in an infinite number of small ones, and if a little laxity occurs here and again there, ere long one gets so confused and bemuddled that he can form no exact idea of what he is really doing. It is not to be supposed that you, in your preparation of mixtures, will be as exact as are we in our experimentations. We are paid for exactness, and not for guess work, that you can do yourselves as well or better than we can, and at a less expense. I mention these matters here, because, very often, exactness is thought by many to be synonymous with impracticability; that a man cannot be exact and practical at the same time. Besides, if an investigator happens to be a little bit lazy, he will more than likely find here an excuse for slovenly work; as it is much easier to argue with himself that such exactness will not be followed by the ordinary fruit grower, than to hold himself to the severe labor that exactness always demands. You may add to a house as many porches, bay windows, towers or woodsheds as you please, but if the foundation is defective the whole house will be rickety and unsubstantial, probably not worth the value of the raw material that has gone into its construction. The experimenter supplies the foundation upon which your success or failure is to depend, and he cannot be just either to himself or you if he allows himself to drift into uncertainty. For my own part, however, I can see no good reason why accuracy and care will not here as everywhere else, prove to be the most profitable part of the transaction, and I believe that the nearer you come to spraying perfectly and at exactly the right time, the more money you will get out of it.

Now, in regard to the application of insecticides and fungicides; I do not know of a species of fungi that possesses any magnetic attractive power that will enable it to draw a particle of Bordeaux mixture from the nozzle, around and among the leaves and branches of a tree, until it is hit by it and destroyed; nor do I know of a species of insect that is likely to hunt about over a whole tree in search of a poisoned spot whereon to commit suicide by feeding upon the paris green thereon. We know that a considerable number of leaf eating insects seem to be able to consume a considerable amount of poison without fatal results. We are also aware that a larger amount of alcoholic liquor may be taken into the human stomach during a hearty, protracted meal, and no intoxication follow, than if the stimulant is imbibed rapidly, and unmixed with food. From this we may infer that the same amount of poison that would prove fatal to the insect, if consumed undiluted with food, might not have the same effect if devoured with a considerable amount of vegetable matter and partaken of somewhat slowly and deliberately. If our supposition is correct, you will at once see the very decided effect that might come of having only the minor portion of a leaf poisoned, as against a leaf evenly though not heavily coated by the arsenic. In the one case you are sure of the insect getting some poison whenever it feeds, and in the other it may get a fatal amount or none at all. I have seen portions of sprayed trees where it looked as though an insect might forage during its entire life, without running any more risk of being poisoned than would the person who ate the ripened fruit in midwinter. It is possible, however, for the most careful spraying to have an effect precisely similar to the most careless. Unless the material is kept thoroughly suspended in the water all care in application amounts to naught. Arsenical poisons, being much heavier than water, require constant agitation to keep them in suspension, and for this reason a cylindrical tank will be found preferable, because its interior will offer less resistance to the free action of the water than a square tank with its many corners. Knowing exactly the capacity of your tank if filled when on a level, it will not be possible to make any mistake in

the amount of water. Knowing the capacity of your tank in advance, during winter or rainy days, the poison can be weighed out in exact amounts and done up in packages, each package holding enough for a tank full of spraying material. In this way you can be sure of reasonable exactness in mixing insecticides, even with very ordinary labor, if you are unable to look after the matter yourself. From careful consideration of the complaints of failure in spraying, I am thoroughly convinced that in ninety-nine cases out of a hundred failures have come from either imperfect mixing or careless application, chiefly the former. It is a defect in all our spraying machines, that the most important part is hidden away out of sight, where it is impossible to see whether it is working properly or not. No possible amount of care will counteract or overcome the ill effect of imperfect mixing of insecticides. If the tank comes in to be refilled, with a fourth of poison still in the bottom, your spraying will have lacked just 25 per cent. of being what it should have been, and your second tank full of mixture will be just 25 per cent. stronger than it should be. If your agitator is imperfect, all of your care in having the proportions correct and applications careful, will be for naught. There is no single point in spraying, upon which so much depends as upon the work of the agitator, and it is certainly a defect in all of our machines, that the operator can never see just what is being done; never be able to determine whether he is using a mixture of a uniform strength; whether the mixture at the top of the tank is not very much weaker, and the bottom very much stronger than it should be, so that those trees sprayed first will be unprotected, and the last given an over amount. This is surely the most crude feature of our spraying machines at the present time, and one that only the manufacturer can remedy. To this obscurity add a couple of men manipulating the nozzles, and discussing politics at the same time, and you have the prime factors in failure.

There are times to spray, and times not to spray, and the margin between the two is often very narrow, and the matter of a few days may frequently decide the point between success and failure. Insects like all animal life, reproduce, not at will, but in accordance to an inflexible law of nature, over which they themselves have very little if any control. With this point in view, you will at once observe how impossible it is to bend their necessities to suit your convenience. If you drive to town to take a train, and that train is on time, you will either be on time or miss your train. It is true that all individuals of a kind do not appear and reproduce on the same day, and often the same individual will reproduce during an extended period of time. This is a wise provision of nature, against the extermination of the species by a single accident, but you should aim to multiply these accidents and spread them over the entire period, as far as possible. It has been demonstrated that the female codlin moth appears, at least some of them, while the early apple trees are in bloom, and lays her eggs in the calyces of the apple, as a rule, and in case the egg is deposited on the side of the young apple, the young worm as soon as it hatches, will make its way to the calyx, and feed from that before burrowing into the fruit. With the falling of the bloom, the calyces are outspread and wide open, but, in some varieties at least, they close up a little later. Now you will at once perceive the difference between getting the calyx charged with poison and taking advantage of this closing over and holding it, as in comparison with the difficulty of placing the poison as effectually after the closing has taken place. We have, in the past, shown that spraying must be delayed until after all bloom has fallen, on account of the bees, but the longer you delay after this, the more you will change success to failure. In case of the plum curculio, most of the books on entomology will tell you to wait until the plums get to be the size of peas before spraying. If I owned a plum orchard, I should do no such thing. We know that the adults from the worms that destroyed plums this season have been in evidence since August, and late in the fall have sought protection from the winter weather in patches of woods, matted grass, brush heaps and similar places; that they will come from out of their winter quar-

ters in spring, and make their way to the plum orchards, guided, in all probability by the odor of the opening buds; that they are in search of food as well as a place for oviposition; that if they do not find leaves or buds to eat, they will gnaw the twigs. Now, it would seem that the very thing to do would be to spray as soon as the buds start, and again as soon as the bloom falls, especially on the edges of the orchard, and kill every curculio possible, before the fruit reached a size to admit of oviposition. Of course, with large orchards, all trees cannot be treated at the same time, but the work can be commenced on time, and pushed, and the earlier varieties given attention before the later ones, even if in different orchards. The weather often conflicts with the work of spraying, and as we cannot regulate the weather, there is all the more need for taking all possible advantage of those factors which we can control.

Lastly, comes the question of appliances and machinery for spraying. To begin with, I am not going to tell you which machine is the best, or which one to buy. We do not all live or dress alike, or build the same style of a house, nor would we be satisfied with any such a uniform arrangement. The machine that will suit everybody will never be manufactured. Even if absolutely perfect, somebody would find fault with it. But we can and will have better machines, and they will come as soon as the trade demands them, and not before. At present, I do not believe we are getting as much good as we might out of the machines we have already got. Last summer while in New York city, Dr. Southwick, entomologist to the Park Department, showed me how he was able to spray the very uppermost parts of the highest trees in Central Park, while the operator stood on the ground, and there did not appear to be any extraordinary labor required. A pole, some twelve to fourteen feet in length, or perhaps longer, of a light, tough material, about two inches in diameter at base and slightly tapering to the upper end, was provided with two light metallic, double sockets, shaped somewhat like a horizontal figure ∞ , the pole being slipped through both of these, but only one being fastened, near the top. Through the other part of this upper socket was passed a smaller pole, lighter, but about as long, with the lower end made fast in the other part of the lower socket, so that it would readily slip up and down the lower and larger pole. In the lower socket, and midway between the two poles, was fastened a small hook or eye, and in the upper socket, at a similar point, a small pulley was provided. A light, stout cord was fastened to the hook in the lower socket, and passed up over the pulley, hanging down to about the end of the larger pole, and by this cord the smaller pole could be easily raised and lowered, sliding through the upper socket and with the lower sliding along the larger pole. To the top of the lighter pole was a fastening which held the nozzle, which by the way was a double one, in place, the hose hanging down and attached to the spraying machine. This hose was much smaller and lighter than that in ordinary use, of the kind known as "linen inserted hose," which is far more substantial than the ordinary article. With the lower end of the lower pole stuck in a socket in a belt, after the manner of a man bearing a flag, and holding the pole in his left hand, with his right and the aid of the cord, a man raised and lowered the nozzles at will, treating the very tip of the uppermost vertical portion of the tree, as easily and as thoroughly as the lower limbs. By dropping the lower pole to the ground, and placing the hollow of the foot against it, the operator was enabled to reach all but the very low branches, as the nozzle was so fastened as to throw a horizontal and not a vertical spray.

This is only one of several contrivances of an ingenious and practical man, but it seemed to me at I watched its use in Central Park, that it was a very desirable tool for those who desired to apply insecticides or fungicides to large trees.

The present year Dr. Southwick has had a spraying machine made that is run by steam, and it appears to me that this will be the ultimate result everywhere, except, perhaps, in a hilly country. This idea of every man owning a sprayer, and you will

pardon me for suggesting, perhaps not knowing how to use it properly, will, it appears to me, finally give way to the professional sprayer, who with all the latest appliances and a full knowledge of how to use them, as well as a practical knowledge of the nature of the most common species of destructive insects and fungi, will be far better qualified to spray intelligently, properly and at the proper time than the most of us can possibly do; then and not before will spraying cease to become a doubtful measure, in any case, and will become an art, and will be so considered.

Mr. Brawley: I have a question relating to the fruit bark beetle and borers. Those are things that trouble us very much and we would like to know how to overcome them. We would like to know if the Experiment Station has found any way better than to dig them out: also the old fashioned borers and the bark louse beetle. They are killing our trees each year in a number of orchards, and as the bark louse beetle seems to be a smaller beetle, whether or not there is not some poisoness wash that would be good to wash the tree with. We would like to hear from the professor.

Professor Webster: So far as the peach borer is concerned, I do not know anything any better than the old plan of going over the orchard and taking them out in the fall. There is nothing that we can recommend that will be a sure prevention, and anything that is only a half prevention gets a good deal more confidence than it deserves, and the trees are neglected.

Now, as to the other one, while it is spreading over the country (it is a foreign insect) and attacking a great many trees, I have yet to see anything that will lead me to change in the least the statement that I gave Mr. Miller years ago, that they would not attack perfectly healthy trees. They may attack and kill a tree if left alone, but taken a little better care of it might pull through. But something was the matter of that tree before they touched it. If you have a weak tree in the orchard they may find it. I do not know of anything that would be practical to spread over that tree to protect it. The thing to do to protect your tree is to increase its vigor. Now, I don't know who it was that gave a very good point in that direction. We have had several dry seasons and several tremendous crops of fruit. The dry weather has brought about the conditions that they want. I don't believe they will touch one tree that hasn't something the matter with it before they begin. Do something to your trees to keep them in good condition.

Mr. Ohmer: You have told us how to get rid of the borer. Is it necessary in that case to dig away the earth so as to get at the worms? What do you recommend to do after the worms are supposed to be killed? How do you fill up?

Professor Webster: I do not know that it makes any difference after you have them all destroyed. Simply pile the earth back as it was before.

Mr. Ohmer: Isn't there a way of preventing them from attacking the tree the year following?

Professor Webster: No, sir; I do not think so.

Mr. Ohmer: Doesn't the egg deposited upon the soft, woody bark, try to get down between the earth and where the bark is soft?

Professor Webster: The young will try to make its way there. I think less depends on the digging away of the earth than of getting rid of the borers in the fall. Mr. Miller has tried that and he can tell you the advantage of getting rid of the borers in the fall.

Mr. Ohmer: At home I have some peach trees and quince trees, and I dug the earth away from around them, and afterwards piled it up around the foot of the tree, and think I am not so sure to have worms in the roots of my trees the year following. I want to know if there is anything in it.

Mr. Miller: I did not just get the full meaning of the inquiry. It is the practice in a good many of our orchards to look over the trees in both the fall and the spring. I can corroborate what the Professor said about the bark beetle. When he talked a year ago about it, saying it attacked only trees of weakened vitality, I felt like taking exceptions to it, and during the summer I thought I found two healthy trees attacked by it, but on a thorough examination I found there was something wrong. I want to say something about our experience in fighting the curculio. Last spring some of you will remember that we had very little spring. It seemed to jump from winter to summer weather at once. This caused the curculio to hatch out very rapidly, and those who were expecting them to come out and were prepared for them, and sprayed their trees very early once or twice before the leaves had started, succeeded in keeping them off and got a good setting of fruit, and those who did not think they would come out any earlier than usual and put off the spraying suffered greater damage.

Professor Lazenby: (Occupying the chair.) That is a very interesting point, and I would suggest that if there are any here who wish to discuss just the subject of the paper presented, that we better have that first. I know there are a few here interested in spraying machinery. We better confine ourselves for a while at least, to that particular part of the question.

President Cushman: I am interested in the best kind of a machine for spraying potatoes as well as tree fruits, and I would like to know what the best machine is for spraying potatoes where you have eight or ten acres, if anyone has experience on that line. I have used a hand pump the last year and there is a good deal of work about that.

Mr. S. D. Willard: I should advise the gentleman to get one of those steam sprayers, manufactured at Rochester, N. Y. I had the privilege of seeing one of them work last spring. The man not only sprayed his own orchard, but put his machine all over the orchards in that vicinity. It is a fact that the day is not far distant when we will have professional sprayers. With a small engine and a wagon

drawn by a team, you will be surprised at the readiness and thoroughness with which they will do the work better than the hand pump. I think this was one of the first machines put up and it was a great success.

Mr. Shirer: How heavy will the engine and wagon be?

Mr. Willard: It was an ordinary wagon; not heavy, and one of those little gasoline engines.

Mr. Shirer: What must we do when it rains every day or every few days, I mean if it is so soft that we cannot drive through the fields?

Mr. Willard: There might be a condition of that kind. It would not in any way interfere with the work of the engine, provided the land was so your team could draw the wagon through the field.

Mr. Miller: Mr. Cushman was asking in regard to a good potato sprayer. I will say that there is one manufactured at Sandusky which I think is as complete as any I have heard of. It is not manufactured largely, but it is a success. I think it costs \$65 or \$75.

Mr. Cushman: I do not want an expensive machine. I would be glad to hire someone to do that work. I do not know of anything I would rather pay for than to have someone do my spraying. I do not want to go to work and buy a steam spraying machine. I have not enough fruit or potatoes to warrant my doing that.

I do not see why a gasoline engine would not be an ideal power to run a spraying machine, and I think it will not be long before that kind of power will be used. It is lighter, takes less attention and everything connected with it works all right.

The Secretary: For spraying potatoes, we take our hand sprayer (the Nixon Orchard and Vineyard cart) and set the shafts over so the horse will travel between the rows, then with one man to follow and with two nozzles, we spray two rows as fast as a horse will go on a slow walk.

In regard to the sprayer spoken of by Mr. Willard, I have promised myself to have a similar one before another season. One objection I find with the machine he speaks about is the capacity of the tank is too small. If I remember, it is only about 100 gallons. Now, one great advantage we seek to derive from a large machine is to obviate the necessity of filling the tank so often; and with the proper conveniences it will take but little more time to fill a tank that holds from five to seven barrels, than it will to fill a smaller tank. I believe before we will have thorough spraying, we will have to have some means whereby it can be done rapidly and effectively. I have used the orchard and vineyard cart for six or seven years with very good results. I have thought of arranging a tank similar to the ones in common use for threshing engines, and using a gasoline engine of one-horse power and a strong pump, and a man could sit on the tank and do the spraying. I am satisfied that the spraying can be done

more thoroughly, and of course we require a good power to throw a fine spray. I believe that will be the final outcome and result of the spraying problem in every neighborhood.

Professor Selby: I look upon the matter of capacity of tank and convenience of mixture as some of the most essential things in spraying. I have not myself seen how the steam power can be applied in the ordinary orchard, but the gasoline engine does seem to offer a thorough suggestion. But how far you will increase the capacity of tank will depend on the ground, whether soft or firm, but mine is not less than 200 gallons and being a half cylinder, it can be mounted on wheels. You get a large, full tank without elevating it very high, and this seems to be a very satisfactory arrangement.

Professor Webster: There are one or two points I want to call attention to. The capacity of your tank of course will be restricted, because every gallon of capacity adds to the weight, and of course there would be a limit beyond which you could not go. Then I want to ask Mr. Willard if he knew the price of the machine manufactured in Rochester, and when he gets on the floor he can tell you something that I want to go in our minutes, and that is a matter in reference to our plum orchards and the manner in which curculio is attacked and the manner in which he protects the tree.

Professor Lazenby: I think that Professor Webster is not aware that we have Mr. Willard on our program to-morrow morning.

Mr. Longnecker: There is one question I would like to know. I will have this looked up and will send the secretary some information. What power is necessary to get the best result? I mean what pressure is necessary to get the best result? The reason I ask the question is, I will look up the working of gasoline engines, as I have an opportunity to go to specialists on them, and it may be of some aid to us if it goes into our minutes.

Professor Green: We have an indicator on our pump, and we never let it go below forty, and from that up to sixty, to the square inch. I think an indicator is an excellent thing. You can tell then how high to have it. If you have a gasoline engine to furnish power you must have an indicator.

Mr. Woodard: I would like to ask Professor Green if the indicator can be fastened on a Nixon Orchard and Vineyard cart?

Professor Green: I think it can be fastened on any kind.

Professor Lazenby: If there is nothing further on this subject I believe there are some local societies that have not reported yet, and perhaps it would be well to devote a little time to reports from local societies.

Professor Green: Mr. President, everyone cannot have an engine to furnish power, but all may have some kind of a hand pump. I do not know as there is very much difference in hand pumps, but we find that a

large air chamber is an excellent thing. Some object to it, saying that the mixture will settle in it. But the air chamber makes it uniform, and a man does not have to pump constantly. With an air chamber he can keep two men at work, and can keep it going a great deal easier than he can without an air chamber. One thing further: Perhaps I should have mentioned that we have had a pump, manufactured at Hudson, Michigan, that has done more work, lasted longer and been more satisfactory than any other pump we ever used.

L. B. Pierce: Is that made by the Morrill company?

Professor Green: It is manufactured by the Bean-Chamberlain company of Hudson, Michigan.

Professor Pierce: Have you ever used that made by the Morrill company?

Professor Selby: We purchased of them last spring. We did not purchase an expensive pump, but it proved a very satisfactory one. It has a small air tube. In the matter of appliances, such as bamboo rods, stop-cocks, the Morrill & Morley company furnish some of the best I have seen.

Mr. Woodard: I think we have not heard from the Portage County Society yet.

Mr. Ford: Mr. President and Gentlemen: I am glad to report that our society is in a very prosperous condition. The interest is not lagging in the least, in fact I think the interest during the last year has been greater than ever before. Our parent we might say was the Montgomery County Horticultural Society, but we have far out-grown that society in size.

Mr. Ohmer: You mean *you* have.

Mr. Ford: No, the society itself. It is seldom that we have less than 150 people that sit down to our good dinners, and generally from thirty to fifty come after dinner. We have had as many as 300 eat at our tables and a good many besides. This is usually on the June day that we call "Strawberry Day."

We have about 100 members that pay their fees every year. I suppose the Montgomery County Society have the wives and daughters and mothers, but we have a good many women that are members of our society and pay their dollar, and they are always ready to take part in our meetings. We have a tent, I will say 24x30 feet. We can set tables in it to seat about seventy-five at once, and after the tables are cleared we can use that for our meetings during the warm weather. We do not use it during the cold weather. We have silverware for about seventy. We have an arrangement with one of our county papers to publish the proceedings within a week or so after the meeting each month; then they take the type and put it in pamphlet form, and print sufficient copies to distribute at the end of the year to the members, and quite a number of copies besides. Our dues are \$1.00 a year.

I spoke of the good dinners, and it is one of the advantages in keeping the society together. Now, there was a time since our society was organized that I thought we spent too much time with the dinners and too little time with the other work, but we concluded that if it were not for the dinners we would not have much of a society. The social feature of it is wonderful. The last meeting was one of the finest we have ever had. I started pretty early so as to be there to welcome the people as they came, and to my surprise I found eight or ten carriages there already. We had about 200 persons at the November meeting. I have acted as presiding officer since last February, and I have made a practice of calling out the people after each paper has been read, or any discussion had, on the report of committees. I get them on their feet, and in that way we have advanced the discussions so that they are better than they were. They take more interest. We have several persons who never used to get onto their feet, that do now quite frequently.

Mr. Shirer: It is somewhat strange how those old Montgomery county members worked. Years ago I lived at a house where they had one of these meetings, and I never knew what was going on. Finally one day I saw in the Philadelphia Press, that I was taking then, come out in a big display "Nick" Ohmer and the big horticultural society in old Montgomery. I thought it must be doing foreign missionary work instead of home mission work. They are scattered all over the world and neglect the heathen right under their eyes. Now, I think horticultural societies often make a mistake trying to do foreign missionary work. Better build up your own county. I honestly believe it is a great work for home missionary societies. (Laughter).

Mr. Longenecker: Mr. Shirer's experience only corroborates what we every one see taking place. Many a man has lived right in sight of a church all his life and never went inside.

Mr. Waid: As to the evidence of the power of this social feature and big dinners of the horticultural societies, I will say that in our county some two years ago this winter, the horticultural society was formed on the social plan; the membership had been steadily increasing until we now have about seventy members. There were just a few of our scientific fellows that didn't just approve of that plan of carrying on the meeting, and in the northwestern part of the county last spring they organized another society. This was to be run for discussing scientifically the pros and cons of fruit culture. At the meeting of the organization there were eight present. The first meeting following there were fifteen or eighteen; at the next meeting half a dozen, and the following meeting one.

Mr. L. B. Pierce: I do not make a report for the Summit county horticultural society, for I was not authorized to do so, but we have a good society there. It is founded on the same principle as the Portage county society. We have from 80 to 100 members or persons present at

each meeting. There is a good deal more horticultural talent in it than in a good many of the societies.

Professor Lazenby: I think we have great reason to rejoice and be proud of the local horticultural societies in Ohio. They are becoming a distinctive feature of our state, and they seem to be growing, not only in number but in interest, and it certainly will have a beneficial effect upon our state society, and our state society can undoubtedly do much in the way of encouraging and promoting the extension of these societies. When I think of the work that is being done by these societies, compared with our county agricultural societies, I think they are far in advance. We have county agricultural societies in almost all the counties of the state, but they do little more than simply hold their annual exhibition. Of course that is good so far as it goes, but our horticultural societies are horticultural schools. Where they meet every month throughout the year, and although the influence may not be visible at once, there can be no question but what they are exerting a great influence for good on the horticulture of the state.

On motion by Mr. Albaugh a recess was taken until 7 P. M.

EVENING SESSION.

At seven o'clock in the evening, the President called the meeting to order, and announced that the first thing upon the program was a song by a chorus of the Athens High School. The chorus delighted the audience and responded to an encore, after which the president stated that the regular program would be followed out, the question box being first in order.

Question: When, where and by whom was the Richland plum originated?

Mr. Longenecker: I do not know that I can answer the question, but it has been propagated in our community for some time. It made its way to us unheralded. A few years ago Mr. Shirer told me that he had a plum that he obtained from the sprouts in Pennsylvania. He gave me some of the sprouts and I took them home and not knowing anything about this that he was giving me, I set them out, and a year or so since I showed some of the plums off of this wood, that is from the original stock that had grown on his place, and we found it a very good specimen of the Richland plum. Since then I find that through some parts of Pennsylvania this plum is still being grown quite extensively by people there for home use, and in some instances they market it. In tracing the plum I find that it comes from Pennsylvania.

Mr. Shirer: I obtained it close to the Lehigh river, near Allentown. It grew on my father's place and in the neighborhood ever since I remember anything. If you want a new tree, you take a sprout and plant it and that brings the original fruit. In 1876 I brought a few small sprouts in my satchel when I was out there to the centennial, and I have plenty of trees from these, and every sprout brings the original plum. Now, in that case neither the soil or anything has to do with the variation. We have one thing that seems to stick.

L. B. Pierce: Is it a Damson style of plum?

Mr. Longenecker: No, it is not. The flesh is salmon colored; it is purple when fully ripened. It is an excellent plum for culinary purposes, and in our neighborhood where known, it is taking the place of the Damson. I think as that plum becomes known it will at least curtail the growing of the Damson. Probably what I am about to say is a little superfluous. Some seem to think that after it is budded, they can still get the sprouts the same. Now, when you bud, it is on a different stock altogether, and any sprouts from that stock would not be the same, that is, if it came from under the ground.

Question: What virtue has apple pomace for young peach trees; how applied and would it pay to haul them three miles.

Mr. Longenecker: No.

The President: Has anybody a contrary answer?

Mr. Albaugh: It has no virtue.

Mr. Ohmer: I would rather pay for hauling it three miles away from my place.

Question: If I sow my young peach orchard to crimson clover or oats about August 1st, can I get a harrow that will cultivate the plants out the next spring without plowing, the trees being low headed? What make of harrow would be most satisfactory? Would spring tooth harrow clog?

Mr. S. D. Willard: The probability is that it would not be necessary to harrow it out the next spring. It would harrow itself out. The experience we have had is, although there are some exceptions to it, that the crimson clover is very apt to kill out. I do not mean to say that I would in any sense underestimate its value, because I believe it is a good thing to have as a catch crop, but at the same time I do not think there is any necessity of purchasing a spring tooth harrow to get it out.

Mr. Longenecker: There are quite a number of favorable reports given of the use of crimson clover in this part of the state. Probably we are a little further south than Mr. Willard.

Mr. Willard: I did not intend to say anything to disparage the sowing of crimson clover.

Mr. Vandeman: I happen to be quite well acquainted with the conduct of crimson clover in the paradise of crimson clover, and that is on the Chesapeake, Delaware and Maryland. It is perfectly at home

there, and I am quite satisfied that it is doing well and will do a great deal better when people get a little better acquainted with it. The crimson clover is an excellent catch crop, as Mr. Willard has said. It should be sown when the ground is moist, then it will sprout and not be killed by an exceedingly hot spell. I would advise anyone to sow it in peach orchards and then plow it up the next spring. It will add greatly to the nitrogen in the ground, and all the nitrogen will be clear gain; it won't cost a cent. I would not sow oats at all. I think it would be a very bad thing.

Mr. Shirer: The gentleman's explanation needs explanation more than his whole answer. He said, "If we get better acquainted with it, it will do better." Now what does he mean?

Mr. Vandeman: If we had more experience it would win its own way.

Mr. Shirer: By what means, if winter kills it?

Mr. Vandeman: I didn't say winter kills it. It is grown to perfection in many places in Ohio and in southern Indiana. I found people over there who are doing it very successfully. Never sow crimson clover in the spring. Sow it from July on until September, and it should be plowed under the next spring unless you want to get a crop of hay from it. I would never let it go to seed in an orchard, but I would plow that clover under the next spring quite early, say in April, and go on and cultivate the ground and reseed it again. But you can continue the crimson clover on the ground until you get too much nitrogen in the ground, because it will stimulate the trees and cause the fruit to rot or fall to the ground.

Secretary Farnsworth: I think the main part of the question has been overlooked. The question is, can he harrow it out without plowing the next spring, if his trees are low headed? I will say that I think the Diamond Disc harrow or cutaway harrow will take it out, if he don't wait too late the next season. I used the Diamond Disc. It is reversible and expansible and contractible, etc. I also want to add one word for crimson clover. It succeeds in some parts of northern Ohio.

Mr. Ford: I do not want it to go on record that it does well all over northern Ohio. I would not give that (snapping the thumb) for it. We have tried it, and as Brother Willard has said, you won't need any harrow to harrow it out.

The President: If you keep getting off of the question I will be compelled to call some one down.

Question: What time of the season is the best to cut back and prune peach trees?

The President: That was answered to-day by Mr. Miller.

Mr. Miller: I would do it when the wood is dormant. I would not do it after the growth had started, because there is danger then if severe cutting is done.

Mr. Aultfather: I would like to ask if you wait until after the hard freezing is over.

Mr. Miller: Our pruners prune any time in the winter when the weather will permit them to be in the orchard.

Question: What are the best crops for a young orchard?

Mr. Longenecker: Apples. [Laughter.]

Mr. Albaugh: Potatoes, bush beans and corn for the first two or three years. Any cultivated crop. I sometimes think corn is a better crop than a good many orchardists think it is in an orchard, because the crop of corn for the first year or two seems to shade the trees, and that is a help rather than a hindrance.

Mr. Ohmer: Corn with me all the time. I find it very beneficial because it partially shades the ground.

Question: What are the best implements for cultivating an orchard?

Mr. Farnsworth: I have investigated this subject a good deal, but am not quite satisfied with the Diamond Disc and cutaway. I have tried several, but have now about narrowed down to the Diamond reversible harrow.

Mr. Miller: Some of our growers are using the spring tooth harrow. It can be used on stony ground.

Mr. Albaugh: There is more in that spring tooth harrow than we may think. To give you some idea, I grew a crop of corn on a piece of land, twenty-two acres, and this spring instead of plowing it, we ran crosswise of that field with the spring tooth harrow, thoroughly pulverized it and put the crop in, and we harvested over seventy-five bushels of corn to the acre.

Professor Green: We have been trying a new implement called the Orchard cultivator, made by the Planet Jr. people, and it works very fine. It has two sets of teeth, one for digging deep, and the other for sweeping. You can set it so you can go a half inch deep or six inches deep, and stir the ground just as you wish.

Mr. Livingston: It is my opinion there can be more improvement in our cultivators than the Planet Jr. people have found out. This broad tooth they set too flat, but they are getting a little more pitch to it every year. Now, I believe in cutting the surface all the time. If you are going to buy a hoe to use in your own hands you would never buy one shaped like a cultivator tooth, and yet when we hitch a horse to it we get a sharp tooth. I think we go deeper than is necessary. I believe in surface cultivation. We would not think of buying such a tooth to use with our hands, and yet the moment we hitch a horse to it we set it different. I quarreled with the Planet Jr. people a few years ago at their home, and I see every year they are getting a little nearer the pitch I gave them fifteen years ago. If their sweep strikes a tough weed it slips over it.

Professor Green: I mean a two-horse cultivator. It takes a strip eight feet wide and it is set so that it won't go around large weeds.

Mr. Farnsworth: It is mounted on wheels?

Professor Green: Yes, sir; and you can regulate it perfectly to any depth; one-fourth of an inch if you desire.

Here the convention was favored with a solo by Miss Jennie Ryan of Athens.

The President: The next paper will be presented by Mr. L. B. Pierce.

POINTS IN THE LANDSCAPE IMPROVEMENT OF COUNTRY HOMES.

BY L. B. PIERCE.

In approaching the subject before us to-night there are some things which must be taken for granted and some which must be entirely left out, because the matter is so broad that it is impossible to even touch upon in a half hour's discourse. I will take it for granted that you do not want to be a score of years behind the townspeople in the outward embellishment of your homes, and that you are willing, like them, to expend labor and a little cash, and I shall pass over all the preliminary matters of forming a lawn, together with grading, draining and making drives and walks. With these matters most are more or less familiar, and what suggestions I shall offer will have mainly to do with ornamental material and what to do with it.

To begin with, the dweller in the country has a great advantage and also a great disadvantage as compared with the resident on a closely built street in a village. His advantage consists in having unlimited room, where he can get fully developed growth of whatever he plants, if he plants at a proper distance, and is not confined in his selection of material to dwarfed or lilliputian specimens of plant or tree growth.

The disadvantages are difficulty of treatment and arrangement and cost of maintenance. The little village dooryard, of perhaps sixty feet front, in which nearly all rear views are shut off by the house, is a very simple matter compared with the arrangement of one or more acres covered by various farm buildings and constantly subject to use as the headquarters of the farm industries. The little front yard of a village home is often a gem of green grass, of graveled walk and well kept shrubbery, while the back yard is merely a place for stringing a clothes-line and a burial place for garbage. I am simply stating facts. I am not complaining because this is so. People do not wear their Sunday clothes every day, and life is too short to try and maintain a village back yard in the holiday attire of the front lawn. The same is true of country door-yards—and it is just here where I want to plant my first stake in the improvement of the farm door-yard. You build a fine house, and it should be the center of a fine and beautiful picture. Your wife and children should look out at various windows at pleasant views. Now how are you going to bring this about? How does the artist do when he paints or photographs a beautiful piece of landscape? Why he sets his camera or camp stool just where he can get such a portion as he wants, and shuts his eyes or the eye of his instrument to all the rest. How is it about the pictures about the average country home—nine hundred and ninety-nine out of every thousand? Is there any attempt to frame or enclose beautiful little pictures, gems which please you more and more as you gaze upon them?

Is not the contrary the case? Is not every tree and shrub trimmed so that if a road made a three-quarter circuit around the place you would be able to see every

single inch of it, save what the buildings covered and what was concealed by the bottom board of some fence. Sometimes a hedge has been planted, but even these are not allowed to be the background of anything. They are trimmed low and broad and simply serve as a fence, and a very clumsy fence they make. Here and there I see little door-yards fenced in by thick, clumsy evergreen hedges, and one wonders whether the owner is a Rip Van Winkle who has been asleep for 100 years and has not yet awakened to the fact that nature works much cheaper along lines of grace and beauty than when hampered by geometry and tortured with pruning shears. Outside, however, of the little seven by nine yard the same trimmed-up bare program is followed, and one again wonders how in this age of the world the owner of a home can be so short-sighted as to confine his evergreen planting to the close-trimmed hedge when the same trees properly distributed would give an air of mingled grace and grandeur, while they kept off every wintry blast, and in comfort alone paid ten thousand per cent. profit on their original cost.

There are cases, however, where a low evergreen hedge may be used with good effect, and without any violations of the laws of taste.

If an apple orchard lies alongside your door yard as they often do, an evergreen hedge may separate the two and answer some very good ends. As a rule apple orchards are not kept as tidy as they might be. The trimmings are often not gathered; broken branches often lie around, and if hogs are kept unsightly weeds appear. An evergreen hedge hides these unpleasant things, and in the spring when the snowy branches hang on every bough, and later when the golden or ruby fruit hangs where the blossoms were, you see only the beauty unalloyed by any disagreeable surroundings. Even supposing your orchard to be a model of neatness every day in the year, (which few are), the hedge furnishes a low background and inclosure for the yard, while the beauty of bloom and fruit above is greatly enhanced. The hedge makes them one, when a fence would not. The hedge may be made a background for a continuous, narrow flower bed, in which your wife may grow balsams, and zenias and marigolds to her heart's content, or low shrubs or herbaceous plants like peonies and irises may be used, and beyond the use of a couple of feet of ground very little encroachment upon the appearance or size of the door yard will be made. The best material for such a hedge is the Siberian larch *larix sibirica*. It needs scarcely any trimming and is dark green throughout the year. If the ground is not high and sandy, the next best tree is the American hemlock, and after this the American arbutus *arbutus*.

Do not I beg of you use the Norway spruce for a hedge, however crazy you may become on the evergreen hedge matter; growing naturally sixty feet high and increasing in beauty from year to year as it develops, it is not the tree for a two foot space in a four foot hedge. Plant your Norway spruce where it will not need pruning, and save the shears for the horns of your cattle, and the toes of your sheep.

Where an apple orchard of four or more acres is located so as to bound a doorway upon the north, it not only adds a certain amount of beauty to the premises, but it serves as an efficient windbreak, greatly breaking the force of wintry winds, and making the doorway much more comfortable for the family. As I have only time to touch a few points in the matter under consideration, we will start from this point of supposing the orchard to be the boundary on the north, which will suit any location upon either side of a north and south street, provided the ground is high enough, and also places fronting south, the orchard in this case being behind the house. Whatever may be the relative location of the orchard, however, it can be but a partial break to wintry blasts because the trees have nothing but bare branches to oppose to the winds. Now, if we can supplement the orchard with something that is nearly wind proof and live all winter in a comparative calm when blizzard winds are blowing at the rate of fifty or sixty miles an hour, does it not seem foolish to fail to do it, especially when the cost is very slight, and the sun and earth

and rains do the main part of the work? You sheet up the sides of your house with boards and spread tarred paper over this before you put on the finished siding; you put winter storm doors upon your porches and rubber weather strips on doors and windows at considerable expense that your family may be comfortable in winter and to lessen your fuel bills, rightfully arguing that all the cold that you can keep out does not have to be warmed up afterwards. You put a tight board fence around your barn yard and locate your straw stack so that cattle may get behind it and protect themselves from the wind, yet you let the wind blow at will across your premises and under your trimmed up trees and shrubs, without any attempt to use what the wise creator has provided for just such emergencies. You buy a beggarly half dozen of coniferous trees, and where do you put them? Why you scatter them about the lawn, to become in a few years overgrown nuisances, hiding windows and obstructing views, and serving no good end, simply because they are a good thing in the wrong place. You face a bitter northeast wind, and you suffer intensely, although the thermometer may be up to 40 degrees; you turn the other way and drive at the same pace as the wind and you become comfortable. Any grammar school student can tell you why this is. In going one way the wind drives the heat from your body, and the other way being in a constant calm you retain the heat. Why do you not use the logic of common sense which all these, patent facts force upon you, to make your dooryard and stock yards as quiet in a winter's blast as the sitting room of your house! As I write this, I am sitting beside a north window and look out a few rods to the northwest upon a beautiful bank of evergreen trees, the tallest of which are about forty feet high. The west wind is blowing at the rate of more than thirty miles an hour and the tops of the Norway spruces bend several feet out of line, yet a dead fly hanging from a single spider's web from the outer sash is not disturbed, and a pair of stockings pinned to a clothes line a couple of rods away do not show that a wind is blowing. I have a photograph of this group of trees and will pass it around for you to see how simple and easy it is to protect one's home from the bitter winter winds. Evergreens are very cheap nowadays like everything else, and the price which you ungrudgingly pay for boarding in your porch, would pay for trees that would protect an acre of ground for a life time. Evergreens are not only useful for protection, but they form one of the best materials for the decoration of country places that can be procured. In smoky towns they become thin in foliage and positively ugly, but out in the country where the rainwater is not clogged with soot, and the air is pure and the sunshine unobstructed, the conifers are the most beautiful of trees and fill a place that nothing else can fill. As I told you in commencing, one cannot have a picture that takes in everything. There is a limit to the vision and to the understanding, and we enjoy most things in detail. Stereoscopic pictures of different views in the Yosemite valley, of big trees, of geysers and remarkable canyons, are pleasing and serve to while away many idle moments, but a single picture of 100 miles square of California or Colorado, would be of little interest even if it could be taken so as to be perfectly plain, as one would weary in studying so much at once. As the majority of country places are planted there are no details. One gets scarcely anything new to look at either in driving by or in driving in, because it is all in sight.

A judicious use of conifers, or evergreens as they are popularly called, changes all this and with care in arranging in groups, and with the groups lapping or breaking joints, a few dollars expended in young conifers can be made to entirely revolutionize country homes. The trees may be made primarily to shelter the grounds from prevailing winds and secondarily to serve as screens and backgrounds, shutting out things that would mar to some extent the pictures you wish to make, and bringing into strong relief the plantings of trees and shrubs and flowers with which you are endeavoring to make pictures.

Some of our most common shrubs and trees take on a new form of growth and beauty when planted close to conifers. The sweet-scented syringa which usually

grows about ten feet high, if planted close to a Norway spruce, will grow twenty feet high and spread a thin growth over quite a wide breadth, making a white sheet of bloom many times larger than would be got in the ordinary way of planting, and the beauty is greatly enhanced by the contrast of the dark green of the conifer. The common dogwood also runs up for air and light when planted close to conifers, and loses none of its floriferous habit. In autumn when the leaves are gone, the scarlet berries show beautifully against the dark green background. If one has groups on both the south and north sides of the dooryard, plantings of shrubs and herbaceous plants may be made in front of each, and the season of flowering of each variety prolonged about a week, those with a northern exposure being about a week behind those with a full chance at the sun. By planting early varieties of peonies on the south side of a group of evergreens, and late varieties on the north side, the season is prolonged nearly two weeks, because the sunny plantation will be ahead of time and the shady one behind. Of course it is necessary to have some intermediate varieties in each group, or there will be a hiatus in the succession. One of the least artistic features of country planting is the rectangular arrangement of everything. Most owners of broad acres are so choiced of land that they can have no gores or triangles or curves in the outlines of the dooryard or barnyard, and so everything is gauged to fit geometrical enclosures. By the skillful planting of conifers, the corners of a lawn may be planted out, so that the enclosure takes an entirely new appearance and form. There is just as much difference between a rectangular dooryard or lawn, and one properly defined by irregular curved outlines, as there is between a square water tank and a beautiful lake. In fact you have but to go out onto a small lake surrounded with wooded banks and look around, to get some idea of what many country homes might be made. Here and there the surrounding foliage rises in solid masses, hiding everything beyond; in other places they open in bays, disclosing masses of foliage within, and deep shadows. Sometimes in autumn a bush or tree in some recess puts on a bright scarlet or golden hue while the rest are green, and lights up the shadowy recesses with a new beauty. Sometimes a mass of the black alder with its scarlet berries fringes a marshy shore and all through the dark days of November and December, flaunts its red flag in the face of wind and frost with the unrelenting tenacity of an anarchist. Here and there perhaps the wooded banks of the lake give place to bits of meadow and over them you get glimpses of waving crops and quiet farm scenery, and as you sail or row across the lake, these pictures constantly change and occasionally one comes of such charming beauty that you stop and for a time drink in the beautiful in full draughts, just as you would a cooling drink on a very hot day.

If you can isolate a country dooryard from all the rest of the world by orchards and conifers and shrubbery in graceful groups, leaving here and there pretty glimpses of the street and outside world, then you have mastered in a measure the secret of landscape embellishment, and lifted your home out of the humdrum sameness, and uninteresting mediocrity that characterizes so many country homes. Materials are so abundant and homes vary so in their environments, frontage and topographical details that an almost endless variety of details can be worked out without having any two alike. In planting it is not necessary to go out of the wild growths of Ohio to get a great abundance of the very best of material. We have half a dozen indigenous conifers growing on the banks of the rivers emptying into Lake Erie. Of deciduous trees we have oaks, elms, maples, the buckeye, liquid amber, sycamore, cucumber, tulip, basswood, dogwood, and others.

The list of native shrubs is still larger, and I need but to mention some of them to immediately remind you how often you see them used as the leading features of park planting in all our cities. The red-twiggèd dogwood easily leads, and then we have the clethras, several spireas, the azaleas, the wild rhododendrons or laurels, the yuccas, spice bush, wyche hazel, and numerous others. In the edge of a clearing in

a bit of wet clay slightly lower than the surrounding ground, there is at this time a group of the black alder loaded to bending with a wealth of scarlet berries which will not drop until some pretty cold weather comes in December or later. Nothing could be brighter in the early winter days than this bit of wild shrubbery. Only a few days ago I went at the invitation of a friend on a ramble in the Cleveland parks and through some private grounds of which he had the entry, and the bushes which seemed the prettiest at this leafless time of year were those of the wahoo or burning bush, which grows wild all over this state. In this wild state the berries are but sparingly produced and cut but a small figure in its appearance. Planted in rich soil and severely cut back each March, it produces its bitter-sweet-like berries, in the greatest profusion, hanging like masses of currants all over it. The same was true of the coral berry. On my own place the shrub which attracts the most attention is a plant of the black willow or pussy willow as popularly called. It stands near a long-leaved pine and early in the spring puts out myriads of catkins, which under the stimulous of good soil, grow to extraordinary size, and color up to a bright yellow that almost deepens into an orange. I cut out considerable wood each winter and the result is enormously long shoots which bloom throughout their length and with the pine for a background, making a striking and high-toned combination. It is twenty feet high and does not occupy more ground than a good sized currant bush. Nothing could be more commonplace than a pine tree and a pussy willow, yet if you will visit me next spring I will show you something very uncommon, simply accomplished by putting the two in such a position that the willow has a chance to show what it can do in the ornamental line. There is another little tree growing wild all over Southern Ohio, that does not show what beauties it can unfold until you put it in front of some dark conifers. This is the red bud or Judas tree. Growing in thickets and blooming before there is much foliage to be seen, it is not half as showy as when backed by a solid wall of green. The same is true of the azalea nudiflora.

The arrangement of material can only be treated in a general way. If we go to nature we find that groups and plantations of shrubs and plants are increased and enlarged from the center outward. We observe a neglected field, and we find here and there around the fences various growths pushing out into the plow land. Along the central line of the fence trees have started and under their protection brambles and elders and hazel bushes have gained a foothold, and are gradually but surely encroaching upon what was once meadow or stubble. If we should start a mowing machine after a few years, and only go to the edges of the groups of brush growth we would find that we had a very irregular and jagged boundary instead of a straight one, and if some of the elders and hazel bushes had pushed out into the field far enough, the result would be that one driving along a lane at one side or walking across the field, would get different views, not only of the fence and smaller growth, but outside views would be framed in smaller or larger forms, and give variety and perhaps beauty that would not appear were the fence rows and borders of the field cleaned up as on nicely kept and thoroughly tilled farms.

A still better pattern would be the edge of a woodlot where more ornamental growths had pushed up under the drip of the larger trees and made a border of undergrowth, and made a pleasing and graduated connection with the adjoining field. Some growths we naturally expect to find in the borders of all woods that have not been denuded of underbrush.

Saxifrage, dogwood, redbud, hawthorn and June berry appear at such points and make the border interesting with flowers and foliage.

We see from the examples which I have cited that nature makes the beautiful pictures which we everywhere come across in the wooded portions of the country by using the forests for a background, the meadows for a carpet and showy shrubs and small trees for artistic material.

If you are a close observer you will also notice that her most wonderful effects are the result of massing and close combination, while the practice of the farmer and country resident is exactly the opposite. Everything is scattered, and the beauty of the lawn is frittered away by promiscuous planting of whatever a persuasive tree agent with plate book may sell the owner. Professor Bailey says of the ordinary type of dooryard, "that the trouble is not so much that there is too little planting of trees and shrubs, but that the planting is meaningless. The bushes and plants are scattered promiscuously over the lawn. Such a yard has no purpose; no central idea. It shows plainly that the planter had no constructive conception, no grasp of any design, and no appreciation of the fundamental elements of the beauty of landscape. Its only merit is that trees and shrubs have been planted; and this to most minds comprises the essence and sum of the ornamentation of the grounds. Every tree and bush is an individual, alone, unattended, disconnected from its natural environments, and therefore meaningless. Such a yard is only a nursery, or a collection of curious plants." He might have added that the most distressing feature in this haphazard mode of planting was that people kept on in the same old rut and refused to profit by the example here and there to be seen of the more artistic and natural methods.

Only the other day I was riding on an electric line west of Cleveland, when we passed a beautiful little house set in the midst of an immense millet stubble. The lot contained about a third of an acre in an oblong form, with the house set pretty well back, and the whole of the ground, except what the house occupied, was nicely seeded with grass, and was green and beautiful. The house was tastefully painted in green and drab, and the whole made a beautiful oasis in a desert of brown stubble.

At first I thought no planting had been attempted, but closer looking showed little rose bushes and shrubs set here and there in the grass nearly all over the lawn. In some places there was not room to swing a scythe. What that place will look like in a couple of years I need not stop to see. No one in Ohio can go two miles from home without seeing similar examples, wretched collections of meaningless planting. There may have been twenty or twenty-five different plants in the collection. If the smaller and more delicate had been planted in a border close to the house, and the others massed at one side or in the front corner opposite the path, the place would have grown in beauty from year to year, and had a distinctive character of its own. It was the first house in a new allotment I judged, and I thought it might be that of the owner of the large area of staked out ground around it. He hoped to attract city people out there to settle, and it seemed a pity that with such a chance to use the latest and best of landscape knowledge, that he should drop into the same miserable old rut. There are certain economical advantages of massing trees, shrubbery and plants which make it pay, even if no beauty is gained. This is especially true if the grounds are to be neatly kept. One old farmer I knew who liked to swing a scythe, and mow a full clean swath, said he made it a rule to mow off everything that was so close that he could not have full swing, and his wife mourned the loss of more than one choice plant because she persisted in planting here and there all over the yard. Had she massed her planting there would have been no trouble, and her husband having unrestricted swing in the greater part would have respected the borders. What is true of scythe mowing is also true of the lawn mower work. It is no pleasant matter to clean up around rose bushes and shrubs scattered here and there over the lawn, and the careful ridding up around them with grass hook often takes more time and a good deal more patience than mowing the entire lawn. If shrubbery is massed the ground can be cultivated and enriched, having clearly defined edges to the beds, making the mowing with either a scythe or mower pleasant and rapid, instead of pottering and incomplete. Shrubs and rose bushes make a better growth

and answer the end for which they are grown much better if kept in cultivated ground than if planted promiscuously in the sod. Peonies and roses and weigelias respond just as certainly to good cultivation as do asters and balsams and geraniums, and for the first few years all may grow together with fine effect, the annuals and bedding plants filling the intervals between the small shrubs. Some of our most beautiful ornamental shrubs are of little account if not in a thrifty condition. An example may be given in the red dogwood, or willow, as it is commonly called. The old branches as seen when growing wild in swamps, are cinnamon colored and not beautiful at all, but transplant a bush to a mellow rich soil, and cut it back annually, and all the wood is a bright crimson, making the most effective winter shrub we have in the deciduous class. The ozier willow growing wild is not ornamental, but transplant it to a rich, moist bed in a lawn and cut it back for a few years until you have a large stool, and it makes as striking a winter ornament as a bunch of pampas grass does in summer. I have seen a stool with eighty whips nearly eight feet high and spreading over a circle of six feet in diameter, the bark being of a reddish brown and looking clean and neat in the winters' sun, rising through a blanket of snow.

There is one other advantage in massing ornamental planting, and that is, that you can increase your specimens for years without seriously impairing your pictures or crowding your grounds. This can be done in two ways, either by starting new groups or by adding to the points of those already planted. For example, you start with a background of an irregular group of Norway spruces, planted around the northwest corner of your lawn, filling the angle and presenting an irregular semi-circle to the southeast.

The Norways in good soil make a rapid growth and in eight years will be twenty feet high. At the time you plant them, plant in front, (to the southeast), some white dogwood, redbud, and large varieties of lilacs and syringas. Now it is not necessary to go farther with the planting for a year or two, but let the matter rest. You know what you have is all right, and you can study the shrubs which you see in villages and elsewhere, and as you make up your mind to something you want, get it and plant it in front of the others, always remembering to use something which will not overtop what you have already planted. If you are fond of choice evergreens, you can continue the Norways to the east along the north side, but instead of using Norway spruces, plant blue spruce, Nordmann's fir, and other desirable rare evergreens at the backside, and afterwards add to the collection in front, of rarer and smaller varieties, such as the retinasporas, and other beautiful forms of the coniferae.

If you begin in this way gradually adding to, as your knowledge and taste grow, you will eventually come into a heritage of grace and beauty that will be a source of constant pleasure.

The horizon of your thoughts and observations will constantly widen, as your surroundings grow in beauty, and increasing age will find you with accumulations that no outward reverses or accidents can deprive you of without destroying your eyesight, or dethroning your reason.

The President: We will now listen to Professor Lazenby as he tells us about "Horticulture and Health."

THE RELATION OF HORTICULTURE TO HEALTH.

By PROFESSOR LAZENBY.

Ours is an eminently practical age. The energy of our people is mainly expended in the production, manufacture and distribution of articles that nourish the body, gratify the senses, or in some way contribute to the comfort and convenience of mankind.

Mind is steadily dominating matter, and this extension of the sovereignty of man over the material forces of the earth we call civilization.

The art of horticulture consists primarily in transforming, by means of cultivation, crude and worthless materials into substances valuable as food products, or useful in ministering to our love of the beautiful. This raw material is furnished by the soil, and such substances as may be added thereto, together with certain elements of the air.

Etymologically speaking, *horticulture* means the cultivation of a garden. The real scope of this definition depends upon the meaning of the word *garden*. According to philology, this word comes directly from the Anglo-Saxon *gyrdon*, to enclose. It is the root of the verb *to gird*, meaning to encircle.

Gardening and horticulture, like farming and agriculture, are synonymous terms. We should remember, however, that the full scope of the meaning of a word is not determined by its derivation. This must be sought in its general use and common application. By this standard, horticulture readily separates itself into four great divisions, each of which may be many times subdivided.

These principal divisions are:

- I. Pomology, or fruit culture.
- II. Olericulture, or vegetable gardening.
- III. Floriculture.
- IV. Landscape horticulture.

The first two of the above divisions belong to the realm of industrial or domestic art. The third, floriculture, is both an industrial and a fine art. While the last, landscape horticulture, lies wholly within the province of fine art.

Horticulture is more than a mere trade. It is more than a productive industry. Its successful practice is based upon great laws which have been deduced from the natural and physical sciences.

Many of these laws may be arrested, modified, or set in motion at will.

The horticulturist, as he learns the control of these laws is largely in his own hands, becomes an enthusiastic student and investigator, and can scarcely fail to develop a love for rural life—a love that is deep and abiding. Horticulture may justly rank as a science, as well as an art. Not to speak of the science of the propagation of plants, or the science of tillage, the great fundamental principles of evolution are exemplified in horticulture as nowhere else. Over 6,000 species of plants are cultivated by the horticulturist, and these have produced almost an infinite number of distinct forms.

In these forms, with their wonderful and intricate variations, we can study the laws of Genesis, and the master mind of Baily and others are rapidly reducing the wealth of the facts found in greenhouse, garden and orchard to the semblance of an orderly, systematic and progressive science. The influence of natural and artificial selection, the effect of soil, climate and moisture upon development, the transmission of acquired characters, the formation of new species, are revealed in horticulture as in an open book. Here facts take the place of conjecture, and demonstration is substituted for theory.

Let us consider how horticulture as a vocation stands related to the physical, intellectual and moral well-being of mankind. In order to maintain physical strength and vigor, at least four things are needful. These are pure air, nutritious food, unbroken sleep and muscular exercise.

That vocation which comes the nearest to supplying these requisites of good health can scarcely be other than a desirable one. Judged by this standard, horticulture stands at the very head of the list. Its quiet, its segregation from strife and jealous rivalry, its unequalled opportunities for nature study, make it at once attractive and healthful. Blessed is he who works in the greenhouse, garden or orchard. As a rule, his day's exertion ends with the evening twilight, and he rises each morn-

ing with his physical energies renewed for fresh activity. To him is given that full measure of health only vouchsafed to those who spend most of their waking hours in the free, pure air and renovating sunshine of the open country.

Health is not only wealth, but happiness, and the superior advantages of horticulture as a healthful vocation cannot be too strongly urged.

Floriculture and small fruit culture are preeminently adapted to women. There are few industries where fairer returns for capital and labor expended are more certain; few that can be so well begun with small means, and still remain capable of indefinite extension. Fine fruits and flowers are in universal demand. They are the necessities of the rich and the appreciated luxuries of the poor.

Our densely populated commercial centers, our thronged and fashionable summer resorts, are rarely, if ever, adequately supplied with them. As a rule, they take all they can get, and then look around for more. You might double the largest annual yield of good berries, or fine roses, or carnations, with profit to the producers. The home market for products of this sort is signally elastic, the demand ever keeping well abreast of the supply.

The same is true of winter forced vegetables. In the light of a personal experience of over twenty years, I can confidently affirm that the vocation of horticulture, when wisely and energetically followed, is a profitable one. I believe there are few pursuits which afford as bright prospects, or as full an assurance of reward for intelligent, persistent effort, as does this.

Listen to a few facts. The vegetable forcing houses belonging to the horticulture department of the Ohio State University have an aggregate glass area of a little less than 4,000 square feet. There are two plain structures which could be built at the present time for about \$900 each. The total bench space in these two houses is a trifle more than one-twentieth of an acre. During the past five years, the annual sales from these forcing houses have averaged about \$600.

The following are among the more important crops commercially grown the past year, and the receipts of each:

Lettuce	\$406 10
Radishes.....	52 25
Beets	45 00
Cucumbers.....	48 50
Hyacinths	59 25
Total.....	\$611 10

When we consider that these forcing houses are used but little more than one-half of the year, the result attained is encouraging. It should be stated that in addition to the above crops there were grown in less quantities, and chiefly for experimental purposes, parsley, peppers, eggplant, cauliflower, string beans, onions and a few other vegetables, including mushrooms, as well as a somewhat smaller list of flowering plants.

The cultivation of the small fruits is likewise peculiarly suitable for women. It is a business for both old and young. Examples are not wanting to show signal successes attained in strawberry, currant and gooseberry culture, by women as well as men, when begun in the decline of life.

Small fruit culture is an industry that especially commends itself to poor women who are struggling to support their children in frugal independence. Almost anyone can obtain control of a cottage with a half acre, more or less, of warm southward-sloping land, which can be planted with early vegetables and small fruits, in such a way as to be a source of continuous profit. If a small forcing-house can be added, and this can be accorded that constant supervision without which no indus-

try is likely to prosper, it will be an added source of revenue. In this way many a widow could find a healthful, congenial occupation which did not require her to spend her days away from home or subject her to the caprices of a selfish or thoughtless employer. I believe there is no other occupation in which, for the capital invested, success is so nearly certain as in horticulture. Of every one hundred men who embark in trade, carefully collected statistics report that at least ninety fail. Why? Mainly because competition is so sharp and traffic is so enormously overdone. If one hundred men endeavor to support themselves and families by merchandise in a town which affords adequate business for only ten, it is absolutely certain that a large majority must fail, no matter how able their management or how economical their living. On the other hand, the number of horticulturists in almost any community might be doubled without necessarily dooming one to failure, or even abridging his income. If one-half of the day laborers in the country were to embark in horticulture to-morrow, I do not believe it would render the industry one whit less profitable, while it could scarcely fail to add to the health, wealth and comfort of all.

I shall have a little to say regarding the relation of horticulture to intellectual development. Any true knowledge of the art or practice must be based upon science.

The horticulturist stands face to face with problems which require for their solution the amplest knowledge of nature's laws, the fullest command of science, and the best efforts of the human intellect. In this art, study and mental acquisition, together with a habit of observation and reflection, are equally essential and serviceable. However it may be with others, the horticulturist imperatively needs a knowledge of the character and constitution of the soil he tills and the plants he cultivates, and the laws which govern their relations to each other.

Geology, chemistry and botany are the sciences which unlock for him the secrets of nature, and a knowledge of these is among the most vitally urgent of his needs.

Horticulture is an intelligent pursuit, and in its practice the strongest minds may find scope for profitable employment. The one who chooses this profession must keep his mind open and his mental faculties alert by constant observation and study. Horticulture is esteemed by all, because every useful vocation is respected in proportion to the measure of intellect it requires and rewards, and never can rise above this level.

The relation of horticulture to moral and spiritual development deserves a more extended consideration. The horticulturist deals directly with nature, and finds little or no temptation to juggle or stoop to trickery. "Whatsoever a man soweth, that shall he also reap," is immediately and palpably true in his case. Nature never has and never can be cheated.

The horticulturist, acting as a horticulturist, soon comes to realize that his success depends upon absolute verity, and he is not likely to be lured from the straight path of integrity and righteousness. When he goes into the markets and becomes a trader he is subjected to the same temptations as others, and may be enticed into some of the many devious ways of rascality. The whole tendency of his vocation, however, conduces most directly to a reverence for honesty and truth. It is likewise conducive to a genuine independence and thorough manliness of character.

The horticulturist is not obliged to swallow any creed, support any party, or defer to any prejudice, in order to successfully follow his calling.

He may be a Democrat, Republican, Populist or Prohibitionist; a gold-bug or a silverite; a free-trader or a protectionist; Christian or infidel; yet his fruit and flowers will sell for exactly what they are worth. Social intolerance of adverse opinions is never directed toward him.

But it is horticulture as a *fine art* that has the most abiding influence. Who can measure the effect of the landscape horticulture of our parks and public grounds, or estimate the value of the external adornment of the home?

Horticulture is nature's best interpreter, and through this art the blinded eyes may be opened, the dormant æsthetic powers awakened, and the heart made ready for a just appreciation of the beautiful. It is well to bring art into our homes, to adorn and decorate them with painting and sculpture; but we must not forget that the sense of beauty must be cultivated before the treasures of art can be made our own. If I were called upon to point out one of the most serious weaknesses in our modern system of education, I should answer, "Its failure to accustom the eyes of childhood and youth to the beautiful in nature." The beginning of all true education should be a love of nature: and *nature study* ought to be the dominant note in every educational system.

What a wealth of beauty there is in the tree and shrub and flower—a beauty of which we never tire, and which "is its own excuse for being!" When the art of horticulture arranges trees and shrubs, flowers and lawn, so as to present an expressive picture to the eye, the beauty is multiplied, and this development of the beautiful is the end and aim of all landscape horticulture.

The claims of horticulture in answering our spiritual needs are no less than they are in answering our physical necessities.

In the first and most essential of human arts we are beginning to recognize one of the last and most useful of human sciences.

How and where and when can this art and science best do its appointed work?

It is a part of my social creed that there need be, and should be, no paupers who are not infantile, imbecile or disabled. Yet the world is full of men and women doing nothing, mainly because they don't know how to do anything. To correct this, youth should be a season of instruction in some trade or useful art, as well as in letters and various sciences. There should be a blending of labor with study, of training with teaching, so as to preserve health of body and vigorous activity of mind.

The pupil or student should be enabled to nearly or quite make his way through high school, academy and college, and go forth qualified to face adversity and maintain a healthful independence. One step toward the accomplishment of this desired end would be the introduction into our country schools of manual training in horticulture. The land required could be easily secured, and the necessary equipment in the way of tools, seeds, etc., would not be expensive.

The work undertaken in these training schools should embrace the cultivation of fruits, vegetables, flowers, shrubs and trees. In connection with the above the various operations of propagating plants by seeds, cuttings, budding, grafting, etc., should be thoroughly taught. The collection and planting of weeds, the breeding of the more common injurious insects and the use of remedies, the study of bees, and useful birds, a practical acquaintance with our native trees and shrubs, and other similar subjects, might form a part of the instruction and training.

The introduction of such a course would mean an improvement of our school house grounds, and the adornment of these would have an elevating effect upon the entire community.

If we have beautiful school buildings, with beautiful surroundings, the inference is almost irresistible that we shall have teachers and pupils of greater refinement. To develop all the faculties of body and mind is the aim of modern education. Manual training in horticulture can signally aid in securing this end.

I sincerely hope that the obvious advantages of forming horticultural colonies will be widely and rapidly improved. It would correct the unhealthy congestion of our towns and cities. In no other way can so many be provided with homes, regular employment and good living. By a horticultural colony I mean the association

of from one hundred to five hundred families, in the purchase of a suitably located tract of land, embracing about one acre for each individual. The location, which should be reasonably near some large commercial center, and the purchase of this land should be intrusted to the most capable and honest members of the association. It should be carefully surveyed and divided into a few small lots, centrally located, for the necessary mechanics, and merchants, but mainly into areas of from one to ten acres for horticulture. Ample reservations of the best sites should be made for school house, town hall and public park. The streets should be embowered with shade trees, and every owner of a lot or garden should be encouraged to beautify and adorn it.

I believe such a cooperative effort would secure a modest but comfortable home for any family that could contribute from \$300 to \$500. If the contribution ranged from \$500 to \$1,000 a proportionally better home could be secured. Some of the advantages of such colonization over the isolated system of taking up a homestead may be summarized as follows:

First. One-tenth of the land required under the old system would be found abundant.

Second. It could be far better selected with reference to markets, and more suitable allotments for fruits, garden vegetables, floriculture, nursery, etc., could be made.

Third. Few draught animals and little expensive machinery would be required.

And finally, man's social and gregarious instincts would be satisfied.

While ignorance and miseducation ruin thousands, I believe that poverty resulting from involuntary idleness sends more men and women to perdition than any other cause.

Horticulture may never become a universal panacea for destitution and crime, yet I have a joyful trust that thousands will be awakened by it to a larger and nobler conception of the true mission of labor, and by its practice, along the path of simple, honest, persistent work, life may be made easier, and men and women healthier and happier.

A Member: I would like to ask the Professor if he can give the actual cost of the production of lettuce per pound by the State Experiment Station.

Professor Lazenby: I could give it by reference to notes, but could not give it right here. I know there is good profit on the labor above the expense.

The President: Is there any discussion on these papers? I will call upon Professor Vandeman.

There being a large number of pupils of the Athens public schools present, Professor Vandeman did not confine his remarks to matters presented in the papers read by Mr. Pierce and Professor Lazenby, but addressed his talk to the young people.

When Professor Vandeman had ended his remarks, quite an extended discussion was had upon the habits, peculiarities and varieties of tomatoes, pumpkins, squashes, and other vegetables, which for want of space is omitted.

Upon motion, at 10 o'clock the Convention took a recess until 9 o'clock Friday morning.

MORNING SESSION.

FRIDAY, December 4.

The President called the Convention to order at 9 o'clock pursuant to adjournment, and announced that the question box would be first taken up:

Question: Is there any remedy for the premature dropping of the leaves of the quince, and is the black speck in the fruit caused by the same?

The Secretary: The first part of the query I can answer. The Bordeaux mixture will prevent the leaf spotting. The latter part I am not so certain about, but think that will be prevented by the same remedy.

Mr. Willard: This is an interesting subject, Mr. Chairman, and I will just say that I have had a great deal of experience in that line myself. Now, let us take the quince and look at it in a reasonable way. The quince is not like the apple or the pear, sending down a long tap-root, but it is a surface rooting plant, and we ought to have sense enough to know that we ought to let it alone and not disturb the soil at certain seasons of the year. For a good many years in raising quinces I found just that condition, namely, spotted leaf and spotted fruit. Now, understand, I don't think this proves anything, and don't take me as saying that this does absolutely prove anything. But, incidentally, we had a block of quinces that we could not cultivate, and one season I discovered that the quinces dropped badly and the fruit was getting badly spotted, but we found this little block of quinces were comparatively free from it. Now, what was the occasion of it? In every respect, with one exception, they had been practically treated alike, that is, they had been fed exactly alike. Well, it led me to believe that there might be something in cultivation or lack of cultivation, because in the corners of the fence there were trees on which the fruit was comparatively free from the difficulty. I said we had better not cultivate the ground so much. The remedy was not absolute, but I saw a very great change and from that time on we have done just as little cultivating or stirring of the soil among our quinces during the fruiting season as possible.

But let us go a little bit further now, as we are on that question. The largest and best quince orchard in the United States, or in the world, is one near Geneva, owned by the Maxwell Brothers. They have forty acres in one block and twenty in another, and hence their quince crop has been enormous, and at times they have made a great deal of money out of it, but they have been experiencing this trouble to a greater and greater degree every year for a series of years, until two years ago last fall Mr. J. C. Maxwell, during the packing of the quinces, rode up to my place and says, "Willard, I would like to have you tell me why it is that your quinces are free while ours are all specked up. We have been doing just

what Fairchild told us to do to preserve the foliage of the quince. Notwithstanding all that, this thing is on the increase every year with us. The leaves are becoming more and more spotted."

I says, "Maxwell, I don't do anything."

"Well," says he, "there is some reason for it."

Says I, "The reason may lie in this, the cultivation or the lack of cultivation," but I says, "here is the thing, you have been feeding up those quince orchards with all the barnyard manure you can get; you have been pouring in the nitrogen without limit. There is where you and I travel down divergent roads. I don't agree with you in regard to plant feeding."

"What have you been doing?"

"Wood ashes; bone ashes. Now," says I, "there is the difference. Our quinces are free. We have but very little of it, indeed." And hence, I am a very strong advocate of a more general use of potash and bone meal or phosphoric acid in some form; I don't care what form you can get it in. I believe that that one thing has a great deal to do with it, and I had rather put on a preventive than attempt to cure. You can attempt to cure and it will be in a measure successful, by spraying with Bordeaux mixture, but give me a preventive rather than a cure.

Mr. Ohmer: You say you cultivate, plow, a portion of your orchard, and a portion you do not plow?

Mr. Willard: It was so situated we could not get at it.

Mr. Ohmer: Which is the best, the cultivated or that not cultivated?

Mr. Willard: Perhaps I erroneously or unintentionally led you astray about that. I did not say it is an absolute lack of cultivation; but there is such a difference in the minds of everybody as to what constitutes cultivation, that is, cultivation in a feeble sense. But in the spring of the year, we go through and do what cultivation is necessary to be done for the season, with the exception of keeping the weeds out; but it is not the constant stirring of the soil.

The Secretary: I am satisfied that Mr. Willard's ideas of the quince are correct. I have planted at different times several small lots of quinces, and always made a failure of it. I cultivated them thoroughly and fed them well, but had to give up quince culture. Then, I had a row of ten or a dozen standing in an out-of-the-way place where it was impossible to cultivate them. Of course I didn't let them grow up to weeds, but threw mulch around them, and I found that they were thrifty, bearing abundantly every year; so that now I have discontinued thorough cultivation. And I always practice spraying, and I am satisfied that this is the secret. I began to realize that the quince roots were so near the surface of the ground that they would not bear the same cultivation as the pear and apple.

Mr. Willard: I don't want to be misunderstood in regard to spraying with Bordeaux or anything else. I endorse this fully, but I say, give us a prevention rather than a cure.

Question: How may an apple orchard fifteen years old be made fruitful?

Mr. Ohmer: The man that wrote that ought to give us a little more basis to answer his question. The question is hardly fair. I would like to know whether the man cultivates his apples what he does to them? He may put on too much stable manure. I venture to say that I will take a limb of his tree at that age and mutilate it so that it will not make such a growth, and the next year it will give him apples.

The Secretary (?): It may be an excess of nitrogen. I had an orchard that during the first few years was in raspberries and other crops, and I think the effect of the raspberry growth was to check it somewhat. After it had been planted ten or twelve years, I received a very heavy crop. After that the raspberries were removed and cultivation and manuring began. It seemed to start too much wood growth and not enough fruit growth. It is now in cultivation, but the conclusion that I came to was to discontinue nitrogenous manures. I have used ashes very liberally, and the conclusion that I have come to is to give it an application of ashes and prune in June, keeping it sprayed as before, and seed it down.

Mr. Brawley: I will say that the orchard I refer to is in grass now. It is a very heavy sod, but it is plowed frequently, and some six years ago, grew a very heavy crop of apples. It has been manured with stable manure, but at this time it is not producing a very heavy crop. Last year was a good apple year with us in most orchards, but its fruitfulness has seemed to be retarded, and there may be some remedy.

Mr. Willard: When the Almighty placed Adam in the Garden of Eden, he gave him dominion. Now, I undertake to say that He has given us dominion practically, over these things to add to our happiness and keep us busy catching bugs. As I say, He gave us dominion, and I undertake to say that the proper application of what we ought to know or what we may know, or by test or experience, we can make almost anything produce that is intended to be grown and rendered productive in the region in which we live. The gentleman referred to his apples. I would try one scheme; if that failed I would try another. I think I have mentioned this before, that I believe that almost any orchard in this world can be brought into bearing at a certain season of the year, by taking that little bit of a fine knife-blade, the point of it, and running it right around the body of the tree.

The Secretary: What season of the year?

Mr. Willard: About the middle of June. Now, understand me. Don't get a sickle and chop the body half off, although at that season of the year, if the sap is in the right condition it will renew the

whole thing. I have tried this and I know what I am talking about. I would not let any man in my employ to-day do this, but I do it myself and I do it on the run. I can go over a thousand trees in less time than it takes me to talk to you about it. A little knife-blade of that kind run right around the trunk of the tree, and you would be surprised to-morrow morning to see what a drawing apart of the bark there would be, and yet you would be surprised to see how quick it would fill up with a mucous formation. For the time being it would stop the flow of the sap; there is a change in the circulation. I tried this and the very next year we picked a barrel of apples from trees seven years from the planting of one-year-old whips. They were worked for a purpose, and that purpose was to produce fruit, and that purpose involved the making of a large amount of wood at the earliest possible moment. You have got to have surface to begin with to start your fruit on, and later on produce fruit.

Question: Should a Baldwin orchard of 200 trees be planted or crossed with other varieties to obtain the best fertilization?

Mr. Willard: That is a big question. I do not know that it is absolutely settled yet. In the first place, if they were grafted over, they would not be Baldwin apples. [Laughter.] I do not know that I am giving you good medicine for this part of the country, but it is good wholesome stuff. Now, this is a pretty broad proposition, and is a statement that would involve some little criticism, but nine-tenths of all the apples that have been planted in the apple growing region west of Buffalo, for the last thirty years, have been Baldwins. They are overloaded with Baldwins, and every man knows that in New York and Philadelphia and Boston and Halifax, they want something else besides Baldwins, because everybody has got Baldwins.

The Secretary: What do you graft with?

Mr. Willard: Now,—I don't know. John J. Thomas once said: "I never open my mouth to say a single thing unless those reporters get it wrong. I really don't say what I mean, or else they don't get it as I meant to have it understood." [Laughter.]

L. B. Pierce: I suppose if we put on Sutton Beauty you would not object?

Mr. Willard: No, sir, I would not. But I don't advocate that you do what I do, because I do some awful mean things sometimes. [Laughter.] But I do undertake to say that there are lots of varieties of apples that can be profitably grafted in the state of Ohio, or Indiana, or anywhere else, but it is necessary to have an application of a little more intelligence than we have had throughout the country. People want to become a little more thoroughly read and practical and apply a little more science.

Again, there is a demand for a great many more and a better class of fall apples than can be bought on the city fruit stands in the whole

country. There is a crying need in Ohio for instance, when Cincinnati year after year has to go to Niagara county, New York, to pick up Duchess of Oldenburg at good, big round prices, and it shows that there is something wrong with you fellows in Ohio. And the best orchard that exists to-day in New York is made up of the Duchess of Oldenburg, and they went to Cincinnati at from \$2 to \$3 a barrel in the orchard, trees propped up with forty props under every tree.

I grow the Longfield—a Russian variety. I haven't much confidence in the name Russian attached to it, but we have got something out of it. It has a good foliage. I don't care what you have in the way of fruit, unless you have a perfect foliage to begin with you might just as well be doing something else. You better be down hunting those bugs with Albaugh in Georgia. [Laughter.] There is the basis. I don't care whether it be upon the pear, the peach, the plum, the apple, or anything else. Now, we have a foliage, and we have an apple that is stylish and of good quality, approximating the Fameuse, but not quite up to that standard. It can be made an annual producer.

Two years ago last fall J. S. Woodard, of Lockport, came up to my house, and he says: "What have you got to see, of interest?" I says: "We will go out and see." He was interested a good deal in plums, but it occurred to me that he would be interested in looking at the apples, so we drove down there and I showed him some Baldwins grafted over five years ago to Longfield. They had not been sprayed or touched with anything except to be sprayed for codling moth. I said, "What do you think of those?" "Good many apples on them."

I had put the boy down there to thinning out those apples and I had said: "If you don't thin out those apples so they will be at least six inches apart I will discharge you." But I lied; I didn't. We found he hadn't done anything like what I had told him. The ground was covered. I said, "Look here, Woodard, the boy hasn't half done his work. He knows enough, but he didn't do it. Now, look, Woodard, the Baldwin foliage and apples specked up until they look like a kind of smallpox. On the other side the Longfield clean as a gun barrel." There are lots of apples that are almost impervious to the actions of these little forms of life that are taking the life vitals right out of them.

Mr. Woodard: It strikes me that that question has not been answered yet about that Baldwin orchard. I asked the question myself, because one of my neighbors asked me last week.

Mr. Willard: I sometimes get switched off.

Mr. Woodard: He has an orchard of 200 trees and he asked me if they could be grafted with other varieties for the purpose of fertilization.

Mr. Willard: I do not believe that question is fairly settled yet. I do not know, because botanically I have not investigated that thing as Professor Waite has in Washington. As far as the Baldwin is concerned that is not necessary, but there are varieties in which it is necessary.

That was brought up two years ago in New York when I advocated the idea of planting in alternate rows different varieties, not because I undertook to say this variety or that was unfertile, but as a matter of caution an ounce of prevention is worth a pound of cure. I scarcely got my seat before a man got up and said: "I tell you, Willard is on the right line, and I know it. I have an orchard of Kings intermixed accidentally and unintentionally, and we get Kings from it almost every year." Now, there may be some who know more about the fertility of the bloom of the Baldwins than I do.

Mr. Pierce: If half of New York is planted in Baldwins, then there must be orchards entirely Baldwins.

Mr. Willard: Lots of them.

Professor Green: I wanted to get at this fact. You hinted that there are some seasons when some varieties will self-fertilize and others will not.

Mr. Willard: It is not a safe practice. Sometimes it may work, but it is not a safe practice. I really do not like to place myself on record upon this.

The Secretary: Is Sutton's Beauty large enough for a commercial orchard?

Mr. Willard: Yes, sir. I didn't come here, however, to blow my bugle, and I mean to have that understood. But the history of the Sutton Beauty, or the history of the apple trade of the country is this, that an apple that approximates to that size is large enough and more satisfactory at least than an apple of greater size.

I do not know of an apple ever introduced into Western New York that is so promising as the Sutton Beauty. It is an annual bearer, has fine foliage and produces the right size. You pick a tree of them and you will not get a small apple, and in keeping qualities they are almost unsurpassable. In March you open a barrel of Sutton's Beauty and they are crisp and juicy, but after you have passed the first of February with the Baldwins you find them mealy around the core. Instead of that the Sutton Beauty hold their good qualities right up to the first of April.

Question: Should Japanese plums be planted in Southern Ohio?

The President: Professor Green, can you touch on that?

Professor Green: I have said all I have to say on that subject.

President Cushman: Is there anyone that can speak from experience on that subject?

Mr. Albaugh: We have been planting quite a number—four or five big plum orchards, in Miami county, and a good many Japanese varieties. The Burbanks have given good crops and good satisfaction. I think we ought to have a little more experience with the Japanese before we put all our eggs into that nest.

Question: Would you put stable manure on peach trees?

Mr. Albaugh: I think not.

Mr. Willard : No, sir.

Professor Lazenby : No.

Here President Cushman introduced Mr. S. D. Willard and announced the reading of a paper by that gentleman on "The Future Crops of the Fruit Grower."

Mr. Willard : A person of my make-up is so apt to make most egregious mistakes in what he says, sometimes, or what he says is so frequently misinterpreted, I dare not fire my guns at any length without some sort of place to hitch to if I get away. And so what I may have to say at this time will be largely in connection with notes I have made, some upon the railroad, and you may find them somewhat disconnected. If so, you will pardon me, for I am a pretty busy man when at home, and I have to put my ideas down just as I can catch them.

WHAT SHALL WE GROW ?

BY S. D. WILLARD.

[Read at Athens and also before Indiana State Horticultural Society at Indianapolis.]

However widely we may differ in opinion on many other questions, we can get upon common ground when considering our own business conditions and fully concur in the sentiment that times are hard, business depressed and profits so knocked out of everything as to cause mankind to lose confidence in themselves and all undertakings and create the inquiry on every hand, what next? The manufacturer, the merchant, in fact the *producer* of everything, each and all have suffered alike and are ready for any change that will seem to warrant a betterment of conditions for the future.

Without reference to the causes that may have led to the disastrous condition existing, the unparalleled prosperity of a quarter of a century without doubt contributed much to a sentiment of overconfidence in the future, and has delayed the process of recuperation, which is slowly but surely under way and will show itself before many months.

The grain grower and stock raiser each have regarded their vocation as harder than that of anyone else, and yet, from my own standpoint, I am inclined to argue that many of the fruit growers have found their profits so reduced as to require the most rigid economy and wise management in their business to pay current expenses and secure a respectable living, and there is a growing inquiry throughout those regions where fruit farming is, or has been, most general, "What shall we plant and how conduct our business to attain more satisfactory results?" For several years the producer has been the servant of the consumer, until the former has begun to question the fact as to whether the business is not simply a sentiment after all instead of a reality.

The demoralized condition of business in every department of trade has been the principal factor and in great part responsible for the unsatisfactory state of affairs as found by the average fruit grower. Overproduction should, without doubt, bear its share of the responsibility, but a lack of consumption, incident to hard times, has played a most important part; hence we are among those who believe that a general revival of prosperity, which is sure to come sooner or later, in other industries will bring its full share to the intelligent fruit grower.

It is entirely true that at times there has been overproduction in everything produced, nor is this a matter of surprise, but the fact itself should be the strongest possible argument in favor of conservative, intelligent work on the part of all en-

gaged in *our* vocation. The manufacturer may enlarge his storehouse and pile away his products for a rise in price. Not so, however, in our business. Our goods are perishable, and when mature must help to overload the already glutted market.

Truly wisdom, discretion and conservatism should govern the fruit farmer in every operation, from planting to marketing, if success follows his work. Sharp competition exists in the markets for *everything* grown, the result of improved methods of transportation, while the refrigerator car brings to our doors in perfect condition the productions of the Pacific Coast, so attractive in appearance, if lacking in quality, as to require care in sorting and grading, too often neglected upon the part of our own growers. Again comes up the question, what shall we grow?

Every year brings to the surface new problems to be solved, new diseases to provide against, and new insect enemies to fight, all of which, to be successfully met, require effort on intelligent lines.

The utility of the work of our agricultural colleges and experiment stations in this connection deserve recognition. They have done a grand work already in the interest of the fruit grower in disseminating such useful information as will enable him to control diseases and combat foes on every hand, while a matter of no less importance is the testing of all fruit products that may be of value to the commercial orchardist of the region in which they are located. Let us not expect too much from them, as it is well known that years of study and close observation are often required to the attainment of results that prove anything.

In my own experience, scores of fruits of different varieties have been nursed and cared for years, simply to find in the end that they possessed no merit as money-makers, and have either been dug up and consigned to the brush heap or grafted over to others whose value is beyond question.

Hereafter the state will lend a hand and share the expense, and, if not teaching us what the markets demand, and how to market that which is grown, at least afford valuable information as to hardiness, productiveness, and other essentials regarding which much light is needed by the average fruit grower.

What I desire to say to you is on practical lines, believing that our business is one that should be viewed and treated only on such a basis, and that when so considered and conducted will one year with another be found to be fairly remunerative.

We may find a loss with whatever we attempt to produce, or, on the other hand, nearly everything may be grown with a reasonable profit. It is quite as apt to be the fault of the *man* as the *plant*. Neglect may be followed by thrift in some department of industry, but not so in fruit growing.

Well, I am not here to outline any specific list of varieties that I would advise the fruit grower of this state to undertake to grow as money makers, believing, as I do, that there are scores of men in this audience, who, from their experience and observation, are far better fitted to afford such information than myself. I can readily tell you of varieties that are best adapted to New York soil and climate, but that does not necessarily prove anything so far as their value is concerned in your own state. Fruits are fickle, but those that are a success in one location may be of no value in another; hence, we can advocate only certain general principles, the adoption of which places us on conservative and safe ground and enables us to keep clear from the danger line.

Much that is grown in the commercial orchard has found its place there by reason of our fondness of that which pleases the palate. Let us discriminate wisely, between that which is grown in a moderate way for home consumption and that which is grown more abundantly for market. This question, when properly considered, is often the question between profit and loss, and may be fairly illustrated in a moment by referring to the difference as found in the currant. In point of quality, the poorest currant that I have ever grown is the variety known as Prince Albert. It is hard meated, acid beyond power to describe, and totally unfit for table use,

while it ripens late, long after the cherry has passed from the market; is especially fitted for long distance shipment, and by reason of producing more jelly from a pound of fruit, of a brighter and more attractive color than any other currant, is sought for and always in demand by the preserving houses at satisfactory prices. A careful computation through a series of years indicates that \$100 to \$125 per acre may be depended upon as net returns for the crop.

My own experience has taught me that this rule may be safely applied to many, if not all crops that we grow. Let us not forget this principle when inquiring "What shall we grow?"

To my mind one of the most promising red raspberries of recent introduction for the marketman is the Loudon, because of its productiveness, attractive color, hard, meaty character and apparent good qualities for shipping. It seems to me that it will become a favorite for the commercial grower, while others not as well fitted for this purpose might be preferred for family use.

First, then, allow me to say, that I think the danger of overproduction of fruit of various kinds is less likely to be experienced in our generation by those who do their work carefully and on intelligent lines than on any other soil products.

"What shall we plant?" says the appleman who, in a season specially favorable for the production of this valuable fruit, finds prices so low that they scarcely pay the expense of picking and packing—as is the case this year in the Empire State. Well, I would plant apples, but varieties that others have not planted, observing particularly hardness, adaptability to climate, productiveness and fitness for the market to which they are to be sent. Mankind are quite noted for following each other closely, and herein is the mistake of the masses, and the few that keep out of the popular crowd, and act on their better judgment are quite apt to hold the winning hand.

So think the growers of Baldwin apples this year in the east; probably three-fourths of the orchards planted during the last forty years in New York and the apple regions of the east have been this one variety; hence, with a full crop as in this season, every buyer of apples wants other sorts and Baldwins are a drug. A correspondent from Nova Scotia in a recent letter to me said: "My Gravenstein and Ribston pippins have paid me well, bringing double the price of Baldwins; the latter are in surplus and are not wanted." A friend, a few years since, who has ten acres of Duchess of Oldenburg, said to me: "When that orchard was planted I wanted Baldwins, but could not get but one hundred, and was induced to take nine-tenths of them Duchess, and of late years I have often wished they were *all* Duchess. They have not failed of a paying crop since the fifth year from planting and have paid me more money than any crop grown." Another gives practically the same report on Hubbardson's Nonesuch; yet others, on Ben Davis, Maiden's Blush and other sorts. New York reports in February last gave highest quotations on Rome Beauty and Black Gilliflower, some of the above sorts not noted for their high quality, but good producers, quite free from disease, good handlers and cheaply grown. Now, understand me, I am not an advocate of these or any other sorts for Indiana, but simply desire to illustrate the idea that varieties there are of apples as well as all fruits adapted to conditions existing here that may be grown with profit even in seasons of a glut.

The fact should not be lost sight of that good autumn apples are frequently in greater demand for the city fruit stands than winter sorts. I grow the Longfield for this purpose, a foreigner of recent introduction. It combines beauty and quality in a degree sufficient to sell at the highest price of any in its season, while it can be produced at one-half the expense of many better known varieties; further, it seems proof to the depredations of fungus on foliage or fruit.

But apples can be grown and sold at a lower price than many suppose, and yet afford a living profit, provided handled with a due regard for economy.

A few days since a friend informed me that he sold his Baldwins in October, the product of twenty-five acres, at 20 cents per one hundred pounds. Says he, "It seemed a low price at the time, but they were loaded into the wagons and delivered in bulk to the cars, and I find they netted me about \$70 per acre. They were of more value than any other product of my three-hundred-acre farm."

I therefore argue in favor of more extensive planting of the apple where conditions are favorable for its production and facilities for marketing satisfactory. The masses are quite generally neglecting apple planting at this time.

In doing this, however, fail not to cherish a fond remembrance for such sorts of the pear, plum, quince, cherry, apricot, peach and all small fruits as your markets demand and as are adapted to your soil and climate.

The most successful orchard man in the line of my acquaintance was one who claimed he wanted something to market the season through, from June to December. This can often be done, but demands a careful study of varieties and close application to business. It is frequently done in a small way, and now and then on an extended scale, as is the case on the Hudson River, where for years the professional growers have been conspicuous for their success.

As for pears, Bartlett, Keiffer, Duchess, Howell, Clairgeau and Winter Nellis, have each been grown with profit; indeed, they are the most reliable of scores of varieties tested, alike free from disease in leaf, wood and fruit. The Bartlett being a little tender has been more susceptible to some of these troubles than others.

I am a firm believer in growing pears, but would plant only such sorts as observation or experience assured me were money makers.

Of plums it has been my pleasure to have fruited between sixty and seventy varieties, and out of the whole number those that I can grow with profit are limited to about eighteen sorts, while the larger percentage have been found to possess no value in the commercial orchard. I have under test quite a number of new sorts, some of which promise to be very valuable. Where this fruit succeeds, I believe varieties may be selected that can be grown with much profit.

Some of the new Japanese sorts are worthy of a test, as they seem quite well adapted for a wide area of territory in the northern and middle states. Of these so far well tested, none excels Burbank in productiveness, beauty and quality combined. It is unexcelled, while its great excellence as a canned fruit will make it sought for when produced in quantities sufficient to meet the wants of those engaged in this industry. I have now planted for this purpose about 1,500 trees.

As there may be those present interested to learn my choice for general planting of this fruit, I submit the following list, enumerated somewhat in the order of ripening: Imperial Ottaman, Field, Burbank, Fellenburg, Hudson River Purple Egg, Diamond, French Damson, Yellow Egg, Farleigh Damson, Blue Damson, Reine Claude de Bay, Stanton, Grand Duke, Monarch, Arch Duke, French Copper, Middleburg, and Coe's Late Red. The extremely early and late sorts have been the money makers.

A party writing from Michigan in October last, said: "Had our crop have been made up of the late sorts that you advised planting a few years since, the income would have been entirely satisfactory, as was illustrated by the small crop we had of these sorts the past season."

If your soil and climate is adapted to plum growing, you can make no mistake in giving this much-valued fruit a trial.

Nowhere this side of the Pacific coast has an effort been made to grow the apricot to the same extent as in the vicinity where I reside. A great number of varieties have been tested for the purpose of deciding the question as to whether there were sorts that might be depended upon as profitable producers for the market man. The introduction of the so-called Russians undoubtedly gave a stimulus to this work, while of no value. This was followed by importations of sorts most highly com-

mended in England, from which have been selected a few that have been added to our list of valuable orchard sorts. St. Ambrosia, Early Montgamet and Oulin's Early are among the best. It is possible, if free from the dangers of spring frosts in blooming time, they may be profitably grown with you. In point of quality, New York State apricots are far superior to the products of the Pacific Coast.

The quince, as grown in western New York, is one of the reliable fruit products. The variety known as the Orange quince originated here, and has been in cultivation many years. Several varieties have been introduced to supersede it, but so far none have seemed so well adapted for orchard culture. It would seem, from sample fruit I have seen growing in this vicinity, of the Missouri Mammoth, that this variety was especially adapted to this part of your own state, as I have never seen such magnificent specimens of the quince grown elsewhere. This fruit is peculiar in some respects, requiring different culture from that given many others of the fruit-tree class, to produce the best results.

The cherry, at home, over a large area of our country, has received less attention at the hands of the commercial fruit grower than most other fruits that can be so easily grown, while it is a rare thing to ever find the markets overstocked with choice cherries, and California finds an outlet in our cities for her surplus of a quality so inferior to our own in point of flavor that where the right conditions exist for successful production, none need apprehend danger in planting such varieties as are in demand in accessible markets.

Those most largely grown in my own state, combining good carrying qualities with productiveness and freedom from rot, are English Morello, Richmond, Montmorency Ordinaire, as sours, and Schmidt's Bigarreau, Windsor and Dikeman as sweets, the latter three all dark colored sorts, which are more largely in demand than those of light color.

The products of the peach have in the past few years been increased in a greater ratio than that of any other fruit. An overproduction of the grape has induced large plantings of the peach in regions where only that fruit was formerly grown. Cheap transportation and rapid transit have enabled remote sections to place their products upon all desirable markets in competition with home grown fruits, while new varieties of special hardiness have added to the area of successful peach growing until it has become a serious question whether plantings on an extended scale can be advised of this perishable fruit, except where nearby home markets can be readily reached or established preserving houses may be depended on to utilize the production. We believe conservative, intelligent action concerning future peach planting is wise. So far as my observation has extended, of all fruits grown, the reduction in values during the period of financial depression through which we have been passing, has been less marked as applied to many of the small fruits than upon any other stock grown by those in the business. This may not have been true in your sections, but certainly is a fact in those sections with which I am brought in competition. For the past two years the net returns to the grower of currants, gooseberries, raspberries and strawberries have been nearly equal to the average of the preceding eight years. If this be found to be true in regard to any or all of these products, with business resuming its former active tone, an encouraging field is opened to those who are inclined to bend their energies in this direction. For myself, I have found it satisfactory to so combine the growing of tree fruits and those last referred to that neither are neglected. The results have been in keeping with my anticipations.

The question of "what shall we grow" is so related to and identified with the manner of growing and the quality of that grown, that our text covers the whole ground; nor can we see how any separation of these features can be attempted with safety to our work.

Cultivation, feeding, trimming, and all required care is essential to the development of the best of whatever we grow, and without this satisfactory results cannot be attained in any efforts, no matter where directed. In an experience of many years as a practical fruit grower, I have lived to see thousands of dollars wasted by those whose disappointment and loss have been the result of a misapprehension of nature's requirements in these respects. Cultivation does not imply deep plowing and subsoiling, but it does mean such frequent soil stirring as will conserve moisture and all elements of plant life required for a vigorous and healthy growth during the processes of fruit formation and development, and on many soils the application liberally of plant food, composed of what has been styled by a professor of agriculture in one of our colleges as "the tripod of agriculture," namely, nitrogen, potash and phosphoric acid, will be found to be active agents in aid of the accomplishment of the purposes sought. Indeed, few soils there are but what are deficient in one or more of them. Without them nothing can be grown, while with them, properly combined, everything can be produced in perfection. Continued fruit cropping removes a large amount of the two latter, to repair which waste demands special application of each from time to time. The use of barnyard manure is often resorted to with the idea that it combines all wants in the way of plant food. It is excellent for many purposes, but with its excess of nitrogenous matter, we cannot regard it as a well balanced ration for the grower of fruits, no matter on what lines may be his work.

What shall we grow? Let us grow the *best* only, whatever that may be. As a rule, "Whatever is well grown is well sold." Every other condition may be all that can be desired, and yet pruning and thinning must follow in the train for the production of the *best*.

Very many of the most valuable sorts in the commercial orchard, from the apple to the gooseberry, are quite apt, if left alone, to set a crop that cannot be properly matured, hence we believe no possibility exists of urging too strongly the importance of proper, judicious pruning of everything grown, beginning the second year from planting, and following this with a thorough thinning of all the tree fruits so soon as the usual droppings are over. To the inexperienced this seems a great undertaking, but not so with those who have practiced it for years. No work pays one-half as well.

Had the apple growers of New York, in the month of June last, taken all the fruit off of one-half their trees and thinned those remaining so that each young apple had been six or seven inches from the other, the crop would have brought more money, while another crop would have been in sight for 1897.

As it now stands the prospect is no apples for the coming year. The strain upon the trees to perfect the greatest crop ever grown they cannot recover from in two or three years.

Some experiments tried the past season upon one of the best apple orchards in Western New York by the horticulturist of the New York Experiment Station, is here worthy of mention.

The trees selected were those from a row quite uniform in age and size and setting of fruit, running across the orchard. Time, June 25; size of apples from about one and one-quarter inches downward. Adjacent rows were left untouched. The entire orchard had been sprayed with Paris green and Bordeaux. Pairs of trees were selected, thinning one tree and leaving the next. Further, they were divided into classes:

First—Simply removing all defective fruit and all in clusters, with no reference to distance.

Secondly—Removing all inferior fruit and thinning down to four inches apart.

Thirdly—Removing all inferior fruit and thinning down to six inches.

Varieties put under this test were Baldwins, Greenings and Hubbardson's Non-such.

Results showed a marked improvement of *all* treated over those not treated, those treated picking a percentage over those not treated of first-class merchantable apples that would much more than pay the expenses incurred, while on those thinned down to six inches these advantages gained were most marked. The fruit was largest and most highly colored, and when I examined them, just before being picked, the spaces between the standing fruit were fairly well set with fruit buds for another year, while on adjacent rows not treated, loaded down with the ripe fruit, not a fruit bud was discernible.

The difference in color of the fruit was a very marked feature of the work.

Here we have on one hand increase of quantity, quality, color and a future crop. On the other a deficiency of the three first and a total loss of the latter. This upon an orchard regarded by the owner as worth \$1,000 per acre, and which, so far as good culture and high feeding is concerned, is probably unexcelled by few, if any, in the state. His total product was about 3,000 barrels.

Our Experiment Stations are certainly doing a good work for the fruit growers that should be utilized by them.

Of no less importance is this work of fruit thinning upon the tree when applied to the plum, peach and pear. I have seen such irreparable injury done to orchards of the former by overproduction of a single season, that, in their weakened condition, hundreds of trees died from the severity of the following winter.

Choice peaches, such as are wanted for the fruit stands of our city markets, can be grown in no other way, while the same is equally true with the pear. Small, insipid, colorless pears will go begging, while the large, red-cheeked, luscious specimens demand a premium.

We say then, in conclusion, to the conservative, intelligent fruit grower, plant only varieties adapted to existing conditions of soil and climate. Where you plant, plant with reference to the markets you expect to reach. If ambitious to put in your full time and make it a business through the year, grow such small fruit as the experience of others and your own observation has convinced you can be handled economically in connection with other interests in hand.

Let the line be sharply drawn as between the sort wanted for the household and those designed for marketing in everything grown. Often, it is true, the one may possess equal value for both purposes, while still more frequently many choice fruits that suit our taste lack productiveness so essentially that we cannot afford to grow them for others.

Plant and grow only the money-makers, using all such modern appliances as are obtainable for the most economical management and conduct of your work, and the future, in my opinion, affords a field full of encouragement to the grower of first-class fruit products, the prices for which, through a period of business depression unequalled in the history of our country, have been better maintained than those of any other productions of the soil.

If the prophetic vision of some of our most able financiers may be depended upon, we are on the eve of a degree of prosperity, such as can scarcely be comprehended. Let us hold ourselves in readiness to enjoy our full share of its blessings.

The President: I am requested, Mr. Willard, to ask this question before you take your seat: "Is fall or winter pruning of hardy fruit trees injurious, and if so, why?"

Mr. Willard: That depends. We are pruning now. We begin our pruning as soon as the foliage drops, except when the wood is full of frost. Then, what you might call pruning I might call something else. The term is very comprehensive. It takes in a great many things that we ought not to do. Now, what I mean by pruning, is the cutting

away of the surplus growth of the tree that has no business there in the future, and that means the cutting in of those little twigs. It doesn't mean the amputation of a great big limb.

Question: How may we prevent damage to bodies of trees by the so-called sun scald?

Mr. Willard: I would plant such low-headed trees that the sun could not get in.

Mr. Scarff: I would like to ask if you would advise the planting of currants and gooseberries in a young orchard, planted at the same time?

Mr. Willard: I have often said I do not advise other people to do as I do, because I do some bad things. But I do plant them myself. You ask me about it and I tell you I plant and have been planting and shall continue to plant just as long as there is any money in it—our small fruits, made up of currants, gooseberries and such things. I plant in alternate rows or blocks, that is to say, here we have got two rows of plums or pears, or whatever it may be, right through here (indicating). Now, I will plant my small fruits in there (indicating), jump one block or row, then jump again, leaving those spaces to run our wagons or bugging machines through, and it is a good plan. We have got to do everything on business principles or abdicate.

The President: I will call on the Committee on the Revision of the State Fair Premium List.

On motion by Mr. Buechley, the report is adopted and ordered to be forwarded to the State Board of Agriculture.

The President: The next will be the report of the Committee on the President's Address.

Mrs. K. A. Arthur: Mr. Pierce is chairman of that Committee, but he is busy and requests me to read the report.

Resolved, To hold four meetings with as many local societies, sending two speakers, after correspondence with the societies where the meetings are proposed, said meetings to be held previous to March 1st, the arrangements to be made by the President. Willoughby, Millersburg, Delta and New Carlisle are points thought best to try the experiment.

Resolved, That the Secretary take steps to collect or rescue such facts and biography pertaining to the pioneer horticulture of Ohio as he deems of value.

W. J. GREEN,

L. B. PIERCE,

N. OHMER,

Committee.

On motion of Mr. Rockhill, the report of the committee was adopted.

The President: The next will be the report of the Committee on Fruit Exhibits, by Mr. Longenecker.

EXHIBITS.

Mr. Chairman and Members of the Society;

Your committee on Exhibits reports as follows:

S. R. Moore—Apples: Fameuse, Ben Davis, Walbrige, Roxbury, Russett, American Golden Russett, Minkler, Fallawater, Jonathan, Winesap, Lawyer, Rome

Beauty, Northern Spy, Rawles Genet, Stark Hubbardson Nonesuch, Bethlemitè, Mann and Buckingham.

E. H. Brawley & Son—Apples: Finch, Lawyer, Grimes' Golden, Smith's Cider, Ben Davis and Rome Beauty.

H. H. Aultfather—Apples: Wine, Stark, Grimes' Golden, Baldwin, Weaver Sweet, Rome Beauty, Flushing, Spitzenburg, Ben Davis, Ohio Nonpareil and Peck's Pleasant.

Wm. Bobo—Apples: York Imperial, Winesap, Rome Beauty, Romanite, Smith's Cider.

S. D. Willard, of Geneva, New York—A basket of Sutton's Beauty apples.

J. S. Wismer, Port Elgin, Ontario—Apples: Medium size, nearly round, slightly angular, basin broad, abrupt, medium depth, slightly corrugated. Calyx closed. Cavity deep, medium width. Stem slender, variable in length, usually projecting above the apple. Flesh white, tinted near the skin, crisp, juicy, quality good. Ground yellow, shaded nearly over the whole surface with red striped and splashed with red.

J. W. Stackhouse—Apples: Detroit Black, Pewaukee, Jersey Sweet.

D. J. Miller, Salttillo, Ohio—Has on the table an apple that is very handsome in appearance. Large, oblate, basin medium depth, slightly corrugated. Calyx open. Cavity deep, broad, regular, russeted. Stem long, slender. Ground yellow, deeply shaded and splashed with red. Flesh yellowish, mealy and rather dry. Flavor very mild sub acid.

Jesse Simon, Youngstown, Ohio—Sent a seedling pear that is well colored. Its season is about the same as that of the Lawrence, but it is not equal to that well-known variety in quality.

Mrs. Burchfield—Chrysanthemums and geraniums.

Mrs. Hobson—Orange tree, begonias, geraniums, century plant, ferns and auricula excelsa.

Mrs. Burns—Chrysanthemums and cut flowers.

Mrs. Schafner—Begonias.

Miss Jennie Root—Chrysanthemums.

Father Mattingly—Palms, begonias and geraniums.

Mr. Steenrod—Chrysanthemums.

The profusion of choice plants and cut flowers add so much to the character and beauty of the exhibit that we feel assured all have appreciated them. The display of flowers excels any ever made before this Society. The exhibit of fruit makes this meeting in reality a meeting of the Horticultural Society, and this committee recognizes that the men who, in the interest of horticulture and without pecuniary rewards, bring their fruits here for the benefit of the Society, deserve especial mention.

THEO. F. LONGENECKER.

C. L. WHITNEY.

Mr. Scarff: If I remember right it was only a year ago that we offered premiums on fruit and found it objectionable for several reasons. What is the use of bringing it up again? We found then that our premiums were carried away by persons who were not members of the Society.

Mr. Whitney: The idea in recommending it was to make the exhibit of fruits one of the leading attractions at the meetings. I have at some previous meetings, when there was a fine exhibit, felt repaid on that account. Then another thing, we have a chance to look over the fruit and learn the names and learn new fruits. I was present when the

action was taken dispensing with the premiums and heard the reasons for it. The recommendation is not to put us in the same position again. Those premiums were very high, and it was worth the while of an apple grower to bring his apples. But our recommendation is for light premiums that would compensate a regular member of the Society for the little trouble to bring his fruit here, and yet would not be enough to induce some irresponsible horticulturist to make an exhibit simply for the money he would get.

Mr. Woodard: I would offer an amendment to the report that the amounts of the premiums be left in the hands of the Executive Committee to be appointed by the President.

Mr. Rockhill: I move to accept the report with the amendment, striking out the provision for offering premiums.

Motion carried by a vote of ten to eight, adopting the report as corrected.

The President: We will now listen to a report by Mr. Brawley, of Athens county.

ATHENS COUNTY PEACH INDUSTRY IN 1896,

By MR. BRAWLEY.

Fifty-five hundred acres planted in peaches. Eight hundred and twenty-five thousand trees. Crop of 1896, 994 cars, equaling 697,634 twenty-pound baskets; the baskets or packages most generally used averaging 20 cents per basket, amounting to \$139,526.80, aside from the many baskets used and sold at home. Prices disappointing to some growers, but much better than any other product of the farm for the past two years.

The President: The figures of horticulture, when we come to consider them, are simply astounding.

Professor Selby: I would like to call attention to the fact that this is the largest peach production in any county of Ohio for the year 1896.

The President: Is there anything further on the peach industry of Athens county?

Mr. Pierce: Mr. President, I want to call attention to one feature of this paper, and that is, it is so different from a great many I hear in the course of my travels. It jumps right into the business, gives facts and then stops. There is no unnecessary verbiage, and I think the writer should be complimented.

Professor Selby: I would like to give notice that I desire to bring up that question of the so-called sun scald of the apple.

The President: I showed that question to Mr. Willard and he gave the answer, saying that low-headed trees was the proper way to treat that.

Mr. Vandeman: Now, Professor Burrill says that the term "sun scald" is applied to a number of diseases, or what we may call diseases.

He says that sometimes the contraction of the body of the tree through evaporation, causes a cracking of the bark, which gives an opportunity for the spores of the pear blight to enter in the spring when they become active, and that sometimes pear blight takes hold, through these crevices, upon the tender tissues of the tree. But that is not the more common case, that it is not through the heat of the summer in actually raising the temperature of the trunk to such a high degree as to cause the killing of the tender cellular tissue, but that it is caused in the winter time, especially, a certain action or invigoration, or coming into life in the cells in a certain part of the tree and then a subsequent cold snap coming on causing the injury. That is a very common cause of sun scald. While Mr. Willard's answer, is exactly right as I view it, that is to head your trees low in order to protect them by their own branches; on the other hand it doesn't reach the case of the man who has already planted. And that is one thing the people want to know. After I have these trees with their bodies exposed, and they are in danger of dying from year to year, how am I going to protect them? That is the question, and a very practical question we ought to be able to grasp, and so far as my experience has gone, and my observation—and I have had considerable experience and very much more observation in the west where the conditions are much more unfavorable to the trunks of the trees than here; that is, in Kansas, and also as far north as Wisconsin. Now, there is a way to prevent in a considerable degree, the effects of these sudden changes in the winter time, and that is to surround the trunk of the tree with some protection that prevents the direct action of the sun upon it; and in one of my public reports, I gave an illustration of a tree protector made of wire and lathes, or any sort of thing you may have. The wire looks like this woven wire fence—anything that will prevent the direct rays of the sun. You might tie corn stalks about the trees, but of course that is not practical with large trees.

The Secretary: I am very glad to hear the Professor's talk on that subject. Probably I have lost more fruit trees from that cause than anything else. I realize the importance of heading them back, but I grow small fruits in my orchards—and a few years ago we did not have the implements to cultivate that we now have. I headed some too high, especially in pears, the Bartlett and the Howell. A few years ago I found that the bark blight was killing the trees, so I shaved off the dead bark, put on some grafting wax and set up a board, and it would heal over. At that time however, I had no fire blight, but the last two or three years I have had some fire blight. It has been a puzzle to me where the bark blight left off and the pear blight began. In many cases I have also used burlap, hung loosely around the trunk to protect it.

Professor Vandeman: I would like to add another suggestion in this line, and that is to take a broad board and tack it with a nail on the southwest side of the tree. One or two nails driven through this board

into the tree will not injure the tree, and it will protect it. Of course, I prefer not to mutilate the tree.

Professor Webster: I would like to ask the Professor if he thinks it is a good plan to have any of these protectors attached to the tree. That is, if he thinks it is a good plan to have anything come in contact with the tree?

Professor Vandeman: I would rather not have it come in contact with the tree. My plan is, when I put these protectors of lath around the tree, to take some soft grass and stuff in between, so it don't touch the tree. It sometimes harbors insects, and especially the woolly-aphis, which will crawl in and find a lodging there when it would not otherwise. Professor Webster is right in keeping this protection away from the tree, and putting soft grass in the top of this protector will entirely obviate the difficulty.

The Secretary: We were careful in putting on the burlap to get the protectors large enough so that they would not come closely to the tree. We fastened them on to the lower limbs and let them hang down loosely around the trunk.

The President: I have a deep feeling in regard to a matter that was brought up last year in my address and in the action of this Society, and I do not feel like letting it go by this year without bringing it up and trying to keep the ball rolling. I refer to the report of the committee on insect legislation that we had last year. I made no mention in my address, more than to refer to the report and the answers that the secretary might get to the letters that he sent out to the secretaries of the different state horticultural societies. The matter is of just as much or more interest now than it was then, and it shows an apathy as much as it shows anything on the part of the practical growers in regard to this matter. Now, why should we wait until we get these things here before we begin to fight them? You heard Mr. Willard say the way to prevent things is not to give them a chance. The way to keep down insect diseases in our fruits, to keep them from coming in here from a foreign country, is not to give them a chance to come in, and I would like to offer this resolution. It is not very definite, but yet it will help to keep this matter going:

Resolved, That we reiterate our desire to see a movement to keep out of this country all foreign insects, and that the officers and members of this society lose no opportunity to inform themselves on this subject and keep the matter agitated.

On motion of Mr. Selby, the resolution was unanimously adopted.

Professor Webster: Last month at a meeting of the agriculturists at Washington, a series of resolutions was passed by the section of entomology, calling attention to the necessity of a uniformity of state laws, and referred this to the general body, and their action was simply to table this with the expression that it was a matter that they thought best not

to meddle with. Now, not getting any encouragement in that direction they got together, and there is now a committee of the entomologists, consisting of the entomologists of several of the states: Dr. L—— and Professor Smith, of New Jersey; Dr. Roth, of Pennsylvania; and Professor Allwood, of Virginia; and Professor Hopkins, of West Virginia, and myself. Just before I left home I got a letter from the Department of Agriculture, asking if I could come to Washington some time this month in consultation, to see if we could frame a bill that would cover this matter, to be presented to Congress to cover that portion which relates to interstate commerce, and to do that in a way that will not interfere with the legitimate business of the nurserymen. Now, Dr. Aldrich told us that was a point about which no state legislation would avail. Those laws that were passed last year in Maryland and Virginia are really unconstitutional, and what is the use of going on and doing these things when they will avail nothing? Now, what I would like to have is some pointers as to what legislation would be desirable to protect the nurserymen and the fruit-growers. We want something that will not interfere with legitimate business and yet will protect the nurseryman and the fruit-grower. It seems to me that we can get such a bill, and we can get it passed. Men can ship trees into Ohio here that I am almost sure are affected, but I cannot do anything. Our laws can reach only the man that receives them; we cannot reach the man that ships them here, and the same way with the nurserymen.

The President: We might change this resolution a little so that it will conform to the action of this committee of entomologists, by putting it so that it would not only cover the introduction but the dissemination of foreign insects.

On motion, this provision was added to the resolution offered by the President above.

On motion, a recess was taken until 1:30 o'clock P. M.

AFTERNOON SESSION.

The President called the meeting to order at 1:30 o'clock, and announced as first upon the program a paper by Mr. Frank Ford, of Ravenna, Ohio.

PACKING PLANTS.

By FRANK FORD.

The program made for this session of our Society announces that I am to give my views and experience on packing plants. I shall not attempt to exhaust the subject for at least two reasons:

First: It would take too much of your valuable time to read what might be said on this important subject.

Second: It leaves nothing for you to say, and I am admonished that what I say is for the purpose of opening the subject for discussion.

To those who have never had any experience in packing nursery stock for shipment this subject may seem of trivial importance, but to those who have time and again received plants, and often high priced ones of new introductions, that were water-soaked and rotten, or packed with improper material and smoking like a coal-pit, fully realize the importance of proper packing.

I have known five or ten pounds of plants and about the same weight of packing and water, put in a box that would weigh fifteen to twenty pounds, and then shipped by express, when fifteen or twenty pounds ought to have been the weight of the package if properly packed, or if the packer had posted in his mind, or in big letters before his eyes, the *Golden Rule*.

When the Jesse strawberry was introduced, I had great confidence in it, for I had had considerable correspondence with the originator, in regard to it. We listed it in our catalogue and sold a few plants, but we wanted a good supply for our own planting. I ordered 1,500 plants, paying \$90 cash. The plants were packed in two regular bushel baskets, the plants standing on end, closely packed together, with very little moss, roots, foliage and all dripping wet and smoking. The old foliage, except on a few plants around the outside, was rotten, and some of the plants had started a new growth of one or two inches. We filled our orders with the plants least injured, scarcely one of which grew, and planted the balance that were not fully cooked. Less than fifty plants lived, some of these so feeble that they made no runners. We managed to grow plants enough to refill our spring orders, leaving us the old plants for our \$90 for plants, \$3 or more express charges, labor, etc., and all on account of poor packing.

I could mention numerous similar experiences. Will mention one other. When Souhegan and Tyler raspberries were new and high priced, I bought 1,000 of each, to be shipped by freight, from Rochester, N. Y. The plants were packed in two barrels, the material used was fine straw, that to all appearances had been used for bedding for horses or pigs until it was reduced to short pieces. The whole was probably well wet when packed, and when I received them they were in the condition of a steaming manure pile, and of less value.

It will be perceived by what I have said about improper packing that there must be better methods, although just such as referred to are still in vogue. I will endeavor to tell how packing should be done to insure safe carriage, minimum express charges and good condition of plants at destination.

First—There must be a plenty of good moss (*Sphagnum*) at hand; nothing I know of can be used as a substitute. The moss should be green or alive, if possible to have such, yet that which has been dried, if not too much decayed, will do very well. It should be moist, but not wet enough so much water could be wrung out of it. If too wet capillary attraction will draw too much moisture into the crowns of strawberry plants in particular. Moss should be used plentifully, and do not charge 25 or 50 cents for a box that grocerymen are anxious to sell for 5 cents.

As the strawberry requires the most careful handling to have it reach its destination, especially if the transit is any great distance, I will tell you how I think it should be done. As the condition of the plants when dug, and the bunching and tying of the bunches are a part of the handling, we will first go to the field, provided the soil is in a condition that it will shake out the roots, and the day is fine, after the dew or rainy moisture is off of the foliage. This is very important. Lift the plants with spade or fork, and at once gather them in bunches. Before they have time to dry put them in bunches of twenty-five or fifty (never larger), with the crowns of the plants even. This is also very important. (The best material for tying is two or three ply soft hemp twine.) Hold the bunch of plants in the left hand and wind the string around the crown near about the foliage or on the roots below an

inch or so. Do not tie too tightly, just tight enough to hold the plants in the bunch by careful handling. This is also very important. If it is possible do not let the roots become dried to the least degree.

Now the plants are ready for packing for shipment. Use as light a box or basket, if the shipment is to go by express, as safe carriage will admit. If baskets are used, which I consider the best, line the inside with paper, if wet all the better. Set the basket or box at an angle of about 45 degrees, put good moss in the bottom, about an inch deep, then begin at one end with an inch layer of moss; put in a row of bunches of plants, with the roots in a straight position, with moss at the sides and between the bunches, and fill the basket or box in this way. Do not crowd or press too closely. This will leave the foliage free to the air, and packed in this manner, they ought to remain good for ten days or two weeks.

The trouble begins with the strawberry the moment the foliage is wet. Express messengers sometimes think they are doing a kindness if they wet down plants in their care, and the result is rotten plants in a few hours. So much for the strawberry packing.

The next plant that requires about equal care is the Black Cap raspberry. They are as susceptible of injury from close and wet packing as the strawberry. The fine roots should in no case be allowed to dry in the wind or sun. The roots should never touch the wood of the box in which they are packed. Use damp moss but do not pack too closely, as if pressed together tight they soon begin to heat, especially if too wet. I always prefer to receive strawberries and Black Cap raspberries too dry, if not actually dried out, then too wet.

The same general rules should be observed in packing other small fruit plants. Protect the roots from the air with moss, but give plenty of air to the tops, and never soak the plants with water.

Currants and gooseberries are especially injured by wet, close packing of the canes. In packing trees, more moss should be used than is usually used. A fairly good substitute, or to mix with moss, is planing mill shavings, of course with all the water they will hold. Wet straw can be used about the roots, but in the middle of the box to protect the stems of the tree, use dry straw. A slight sprinkling of the trees after they are packed, if the weather is dry, will do no harm. Remember in packing small fruit plants, that water used too freely is sure to cause great injury. In case plants become somewhat dried in digging and become wilted, as will be the case late in the season, it is well to dip the roots, not over half way up to the crowns, in water, and set them for a short time where the surplus water will drain out before packing; but in no case wet the crowns. Remember also that all green foliage and the tender stems of all plants must have plenty of air. That is one reason why it is of great importance that the crowns of strawberry plants should be placed evenly in the bunch. I am quite sure that Black Cap raspberries will carry better if not bunched, but as they are counted by the seller, it will save recounting if tied in bunches of not over twenty-five plants, and care taken to work some moss among the roots. Thus I give away the secrets of success in packing at Sunnyside.

Mr. Willard: I would like to ask Mr. Ford if he don't think it a good plan, in handling strawberries, to reduce the foliage somewhat?

Mr. Ford: I will say in regard to the trimming of plants—of course, my paper was on packing—it is advisable always to trim off some of the outside leaves, never pulling them off, but either cutting or pinching them off. Always in the spring of the year while the plants are green, they can be pinched off.

Mr. W. N. Scarff: There are certain points in the packing of plants that all nurserymen are supposed to know in common, but I find Mr.

Ford knows all the points that I know and some besides, so it leaves me in rather a bad place, to have to open this discussion.

I fully agree with Mr. Ford in regard to the packing of plants in dry or comparatively dry moss. I think there is more danger from having it too wet than from having it too dry. In regard to waiting for a nice day to pack plants in the spring of the year, we find while we have a million or two million plants to pack, we cannot wait for nice days, and we have oftentimes gone into the field and swept the snow from the rows and dug them. Of course that is not desirable.

We follow a little different rule than he does in regard to the digging and tying. We do not tie in the fields. After digging our plants and throwing them in barrels, we haul them to the shed where they are put up by women. We then keep the roots from the sun and not too wet.

There was one point new to me that Mr. Ford brought forth, that is about taking a bunch of plants and throwing them to see if you have them tied tight enough.

Mr. Pierce: What do you pay for help?

Mr. Scarff: Twenty cents a thousand. We had one girl that made \$2.80 a day at that. She put up 14,000, working from the time she could see in the morning until dark. Of course, to tie this number of plants, it requires them in good condition. There are some varieties on which we have a great deal of trimming to do.

Mr. Pierce: Then there is a difference in trimming?

Mr. Scarff: Yes, sir. I am like Mr. Ford in regard to the receiving of plants. I would rather receive them dry than wet. If they are too wet in the start there is sure to be some loss. I have printed on my shipping tags instructions that the tags are not to be wet.

In regard to packing material, I will say we have used different kinds of material, and have received plants packed in all kinds of material, but there is nothing superior to the Sphagnum moss. It will not heat, and it holds water like a sponge.

In regard to packing gooseberries and raspberries and grapes, there is no secret. You want a good strong box to keep them from drying out, and you may expect them to turn up at the end of their destination all right, even in a month from that time.

The President: Is it advisable to have the box tight?

Mr. Scarff: In that class of goods I usually have it tight. We pack strawberry plants in crates which hold from 1,500 to 2,000 plants. We place in the bottom of the crate a good heavy paper, and then the moss; we place alternately with the plants until the crate is full. Then we place over the top a heavy layer of moss and another covering of paper, and then put on a lath top. In good weather they carry very well in this condition, but when the weather gets too warm, we substitute a half-bushel basket. When we have the basket filled we cover it with burlap. This keeps it from drying out and protects it from

the sun. We have shipped plants in these basket during every month in the summer and they have always been put up in good weather. When the weather is very warm, we cut the tops off. We are careful to tie them up well and take a common corn knife and cut off the tops.

In packing the Black Cap raspberry, we use sugar barrels. We have placed the roots to the outside and the tops at the center of the barrels, thus giving a circulation of air, keeping plenty of moss to the bottom and the outside of the barrels. When the weather is warm, we bore holes in the ends and sides of the barrels. However, when the young growth starts, it is not real safe to ship them at all. We then either remove all the green growth and pack in barrels and send by express, or we leave the foliage on, pack them in shallow boxes six inches deep, and leave the tops exposed. We do not tie them.

Mr. Pierce: Isn't that about as satisfactory a way to handle the Black Cap as any way?

Mr. Scarff: After the growth starts, I would rather use the other way. If it is very dry, it requires a little more care. Usually when plants are in that condition it is June, and it is sometimes very warm at that period of the year. To succeed with Black Cap raspberries, you must get them out early in the season.

Always pack your plants as if they were to go a thousand miles, even if you know they are not going only twenty-five miles. Always make it a point to pack thoroughly, and you will save labor and trouble in the long run. In cold weather we always paper-line our boxes to keep out the frost. Should you receive plants frozen in severe weather, don't open them at the time. Put them in the shed where the frost will come out gradually.

The President: I sometimes think after I buy black raspberry plants away from home and have them shipped to me, that I will never do it again. I do not get very much satisfaction from black raspberry plants when they have been shipped to me.

I have been requested by a number of persons present to ask Mr. Willard to talk to us specially on the plum. We will now hear from Mr. Willard.

Mr. Willard: I said to you this morning that I would reduce the number of varieties for market purposes very materially from the number that are being disseminated and sold in the country, and produce early and extremely late varieties. When there is a superabundance of plums, we find, as this year, that they are sold at a low price corresponding with the low price received for peaches. I find that the markets that I seek for my product, may differ somewhat from the markets that you seek for your product. For instance, we run very largely on the Philadelphia, New York and Boston markets, and the people at the watering places who have been off from the first of July for a pleasant time, don't return until quite late, generally along in September. When

they get back, the women want some fruit to can; they want some plums to can, and a great many of the varieties are gone. If we have a repetition of the season we had this year, some of them will be out of the way, and the consequence is that the demand for these fruits, because they want them for sweet pickles, is greater than the supply, and good prices prevail. With a superabundance of fruit in the market this year, the late varieties brought big prices.

Now, to go back a little. I don't think it wise for any one to elaborate very much and tell of the mammoth profits that may be received from the production of plums, and raise the anticipation of people up to that point where they are going to be mistaken. I mean to be very conservative in my statements, whatever they may be. But the impression that I received thirty years ago in relation to the profits of growing that particular variety in which I am most interested grew out of seeing that work done upon the Hudson River, and it is perfectly safe for me to tell you what they did there in those days, without any hope or expectation that you could do the same thing here now. There were a great many instances where a man made a fortune in a single season out of the plum crop on the Hudson River, but with the facilities with which they produced and handled their crops you could understand how they did it. When you get fifteen bushels of Bray's Green Gage (*Reine Claude*) upon a tree and have those picked by the job at eight cents a bushel, and put in barrels without any packing in baskets, and within two hours from that time run into the New York market, and reaching there the next morning at 3 o'clock, and sold before breakfast, you can understand how they made money out of the plum crop. But there is an end to everything, and there was an end to that business and I will tell you how the end came. It didn't take very long in the exhausted and weak state which the continued heavy annual crops produced in those trees to reduce the vitality of the trees. That was the first mistake. They didn't thin the fruit at all, and the vitality of the trees was so reduced that pretty soon along came such diseases as the black-knot. Some of you may have had a taste of it. In that condition they were a ready prey to that disease, because the black-knot don't take hold except when the vitality of the tree has been weakened by some cause. To-day you cannot find a plum produced on the Hudson River, upon either side, unless it is a few of the new Japanese, which are fire-proof against the black-knot. The black-knot has absolutely swept them out of existence, and the worst looking sight that a man can find upon the American continent to-day is to ride up and down the Hudson River and see the destructive influences of the black-knot. You have a law in your state which prevents the spread of that disease. If you haven't you ought to have. There is no more reason for having the black-knot than for having the small-pox in your family.

Now, there is a very great difference of varieties that suffer from the depredations of the black-knot. That question is often asked, "Is there a difference in variety?" Yes, there is a mighty difference. The Lombard is very subject to it, because it overbears, and such trees go into the winter in a weakened condition, and the next year they have no fruit. That is the tendency of all those plums that overbear. One of the best plums I mentioned in the report I made to-day, for dollars and cents with us, is one of those varieties that is subject to black-knot, and that is the Hudson River Purple Egg. And I venture to say on the little six-year-old trees there is from five to six feet of young wood put on last year, two-thirds of which has got to be cut off this winter. It is one of those varieties subject to the black-knot, but not every year, however. Perhaps some of our scientific men, or some of those connected with our Experiment Station, or agricultural college work, will be able to tell us why it is that some years that disease is much more prevalent than other years.

I want to refer again to the Hudson River Purple Egg. I noticed a plum myself, discovered it there twenty-seven years ago this fall. I thought it was a wonderful plum for the market, and I got some scions and carried them home, and grafted them on two trees that were in good condition for cropping the next year, but that had been troubled with the black-knot, but we didn't see a particle more on those trees for six years following.

We have just completed going over our trees for the fall for black-knot. We go over them twice a year, and with 15,000 to 18,000 trees it is quite a little job.

On Saturday night a gang of boys had been around over thirty acres, and when they came in I said, "Harry, how did you find the black-knot to-day?" And he said on many varieties they didn't find hardly any, but when they came down to the Hudson River they found more than on anything else. "Well, how about some of the other varieties? The Golden Drop, for instance?" "Didn't find any on them, but when we came down to the Hudson River again we found more on them than on any others."

Here is another thing. How are you going to get along with that careless neighbor of yours, who don't care whether the black-knot exists or not? There is one way, and that is, you want a little wholesome legislation to fix him. He is worse than a man that has the small-pox. He is spreading a disease that is going to injure all our interests, and now we want to give it to him in the natural way.

Now, as to varieties, I never advocate the planting of any varieties only in a general way. I believe that we can grow the Damson very successfully, but the question is this: they are a little blue sour plum. They are the "Ben Davis" so far as quality is concerned. A Chicago man said to me two or three years ago, "We can handle all the Damson

plums you can send us." They are wanted on the markets. Boston, Philadelphia and New York will tell you the same thing. There is a demand upon the part of those who want them for pickling and preserving, that has never yet quite been met with the Damson. Wherever we can grow any plum, we can grow the Damson with great success. One difficulty we find is the curculio, and that is the thing we have got to fight, but a man has got to fight something in this world anyway. It may be in his social relations [laughter]; it may be a battle right in his home, or it may come in different shapes, and so we might just as well fight the bugs as anything else, and it is a battle easily won. A man that raises plums has got to fight the curculio, but at the same time the curculio is a blessing in disguise, because the majority of those who plant plums won't pay any heed to him. They will let him foreclose the first mortgage, and they will take what is left.

Now, we have got to work along intelligent lines, and not think because we have got a catalogue, Ford's catalogue, or somebody else's catalogue, that tells us that these are excellent varieties or classes, that there is no mistake about it. Don't take it all as gospel truth. There is a little bit of exaggeration, and there are a few varieties that are of no practical utility. That is so in everything else, I don't care whether it is plums, or gooseberries, or anything else. Now, I had a crop of gooseberries that cost me mighty little to handle it, but they realized me from \$700 to \$800. They were nice gooseberries and sold for fine prices in the city of Philadelphia, and the expenses were very limited, but here comes in the mildew. I didn't suppose it would ever come upon them in the world, but I simply had to learn that I had made a mistake. You cannot set aside nature's laws. In this climate, the English gooseberry would be a money maker if you could raise it without the trouble of mildew, but I did not realize that the climate and the soil of Great Britain are different from our own, and planted them upon gravelly land where I had no business to put them, and they at once got the mildew.

But there is money in all of these other crops. It is not confined absolutely to the plum, or the peach, or the pear, and it is a combination of all these things over which we have dominion, that produces the best results. The man who grows the greatest variety, so that if he fails to get a crop of one kind this year, he will not have an absolute failure, is the man that meets the greatest success, for I do not suppose that under the existing condition of things, there could be such a thing as an absolute failure.

Now, in regard to the Richland plum, it originated down in Pennsylvania. I grew it more than twenty-five years ago, but I do not think it is worth growing. In the first place, it is poor quality. It is not good enough size. Now a plum has got to have something. If your horse hasn't got style to sell it, it has got to have gait. He has got to be able to get there in some kind of shape to get the money out of him; and so

with almost everything. Now, if the plums you are raising haven't style, or quality, or don't ripen at the right season, you have got three points against you anyway, and if you can hold a "full hand" with the fourth, you can do better than I can. I prefer the "bowers." [Laughter.] Now, the Richland plum has neither color nor quality, and ripens at the wrong season. On the other hand, it is somewhat of a Damson type, but it is neither a blue French Damson, a Shropshire Damson, nor a Farleigh Damson. The last variety is the best Damson ever grown in this country. The Shropshire has a defective foliage, and that is true of almost all those plums, and as I told you this morning, the basis of the whole thing lies right in the foliage, and if they are defective in foliage, they are no good. The English plums are defective in foliage. What I want to say is that to raise those fruits, you have got to spray every inch of the leaf. We had a crop of blue Damson plums two years ago last fall, and I figured out afterwards that those trees netted us \$9 a tree in the city of Boston. What do you think of that? Little blue pills. [Laughter.] I tell you there is money in the little blue Damson, a native of the state of New York. It ripens just late enough so you can ship it in just as those people get home from the watering places, and the women want something to fix up for Christmas, and so we want to grow the Damson plum. It is a nice, little, healthy, vigorous tree. That is the case with almost all those Damsons.

Now, in the importation of the six or seven varieties of Damsons procured in England, the best of the lot was the Farleigh Damson. The only crop of plums that I have this year that stood the drought and the cold was the Farleigh Damson, and I said to myself, "There is another argument in favor of the Damson."

Mr. Woodard: Now, if any of us should send to a nursery for a Damson plum, and specified any kind of Damson, would it be next to impossible to get that kind?

Mr. Willard: You would not get the Farleigh. There are different kinds of Damsons.

Mr. Woodard: If we wanted a Shropshire Damson and sent for some other Damson, we would get a Shropshire then.

Mr. Willard: Now, I will tell you what you would get. The French Damson I procured in France under the name of "Damson" and kept it separate from the rest and dubbed it "French." It is the best growing Damson in the nursery. It is a great producer and is a plum that always sells well in the market. Now, let me give you the other side of the question. It ripens a little ahead of the Farleigh, and it has not quite as good color. The color of the French Damson is a copper color; the color of the Farleigh is a dark blue. People are attracted by color whether it is in the Damson plum or the Ben Davis apple. It takes the eye. It is that which commends itself to the eye. There is a great deal more in that than you think. There is the beauty with some of those Damsons. The

French Damson is a good grower in the nursery, and hence, when I sell you one of them, you don't turn around and curse me because I have sent you a scrub tree. It has a perfect foliage. The Shropshire Damson is condemned in many parts of the country because it has a very imperfect foliage. They are the worst of all the Damsons I have attempted to grow.

Mr. Whitney: There are Damsons placed in our market every year that are quite small and very blue.

Mr. Willard: That is probably the Shropshire, because it has more generally been cultivated.

Mr. Whitney: That is what we call the old fashioned blue Damson.

Mr. Willard: Then somebody has got a good thing, only the black-knot is more apt to take hold of it than the English Damsons.

Mr. Pierce: There are lots of them grown in our township.

Mr. Willard: The smaller the Damson in the Boston market, the better they like it. They want those little bits of fellows.

A Member: Some of us would like to have you tell us what causes the black-knot.

Mr. Willard: I have been trying to find out, myself, from these scientific men. I do not know what produces it. And I say if the man were living to-day that knew what produces it, he could reap a good fortune.

Professor Green: I think it is pretty well understood.

Mr. Willard: What is it?

Professor Green: It is a fungus scattered by its spores in the wind. It has been known to be carried four or five miles.

Mr. Willard: But beyond that what is the real cause of it?

Professor Selby: It is the result of the growth of a parasite upon the branch of a tree. The parasite grows there and robs the tree of the material which feeds the parasitic fungus.

A Member: Will spraying prevent it?

Professor Selby: Yes, but it is not a profitable way to prevent it.

Mr. Woodard: Do you keep your plum orchard cultivated until it gets into bearing?

Mr. Willard: Yes, that is another nice point. I cultivate my plum orchards very thoroughly but not deeply. The plum is a surface rooting plant, somewhat like the quince. It don't send down a tap root like the apple or standard pear, consequently it wants shallow cultivation. Our system of cultivation is this: Our orchards have all been plowed up to this fall, with a view to having them ready for next spring's work. It is plowed so as to leave the dead-furrow, not very deep, in the middle between the rows of trees. Now, next spring, just as soon as the ground is dry enough to do it, we will go right over those blocks with a spring-tooth harrow.

Some professor here will likely tell me that fall plowing is all wrong. Well, I know that. I have read that I was losing fertility by cultivation,

but there is one thing that we cannot do. We find it utterly impossible to do the work in spring in the little time that we have to do it. There is the harrowing to be done next spring, and by the time we have the harrowing done in those orchards with our capabilities for work, we are compelled to do something else, and that is to go over and roll that ground, and fit it for those bugging machines. And about the time we have this all done, those trees are in bloom.

Mr. L. B. Pierce: If you have only an acre or two, is it necessary to plow in the fall?

Mr. Willard: Oh, no. Now, I am speaking on a large commercial basis. If I only had an acre or two, I would not do it till in the spring. That is the fact of the case, and I would not go to work and do fall plowing if I could do it some other way, because I do feel that it means lost fertility that has got to be restored in some other way.

Mr. Woodard: Somebody spoke about the Lombard plum. All that class have made a rapid growth. How about cutting them back?

Mr. Willard: You can cut back to your heart's content and then you will never cut back half enough. You haven't got the nerve to do it.

Mr. Pierce: Wouldn't it be better not to get such an immense growth?

Mr. Willard: How are you going to help it? You take those Hudson River Purple Eggs, and there has not been an ounce of fertilizer put upon them in four years, and yet they have aspirations greater than an American when he is trying to get up heavenward. You have simply got to cut them back. Our rule is this, to reduce the young wood about one-half the previous year's growth.

The Secretary: Where they are only about three or four inches longer than necessary, is there any object in cutting them at all?

Mr. Willard: No, there is not.

Mr. Miller: The worst trouble we have with plum growing is the rot.

Mr. Willard: The rot can be prevented almost absolutely by spraying. We have sprayed for the curculio, the codling moth and the apple scab, and we don't want to keep on spraying the whole year through, because it keeps a retinue of fellows spraying and doing nothing else. You can prevent the rot almost absolutely by the use of Bordeaux. This is carrying us back to the question of planting, feeding and keeping these trees in a healthy condition, which in my opinion has a great deal to do with the question of rot. We have never had any rot to speak of upon our grounds, but what can be regulated with the exception of one or two varieties, which I have been in the habit of spraying.

Mr. Woodard: Do you ever seed down your orchard?

Mr. Willard: Yes, we have some peaches seeded down. I doubt the expediency of doing so. There is another difficulty in seeding down any orchard, I don't care what it is. It makes a sort of harbor for mice.

Mr. Miller: What can you say about the Burbank?

Mr. Willard: Of the Japanese plums the Burbank is the best producer. I think I am the first man to fruit the Burbank on the Atlantic coast.

Mr. Miller: What time does the Burbank ripen?

Mr. Willard: The Burbank ripens with us about the middle of August. Professor Bailey has put it on the grounds of Cornell University, but he has not made up his mind that it is going to be sufficiently productive for orchard use. I do not say that it will not be so productive, because the two trees that I have, have been cut to pieces for buds, and have not been given a fair test. The best late plums we have are the foreigners, those that came from England and France.

The Secretary: How about the Kingston?

Mr. Willard: It is so nearly like something else I do not want it.

Mr. Yeslin: Where can you buy those varieties?

Mr. Willard: I am not here to do any advertising. I guess you can get them of Mr. Storrs. The Copper is one of the most valuable orchard plums we have. You will not find any nurserymen in America that will grow it and sell it to you at any price, it is so indifferent a grower.

Mr. Scarff: What precaution do you take against mildew on the English gooseberry, besides spraying? I understood you to say there is something in location.

Mr. Willard: There is a good deal in putting them into cold, damp ground and keeping the cultivator away from them during the process of fruit formation. Give them a good, heavy mulch of coarse straw, and under these circumstances a great many of them can be grown with success and profit.

Mr. Miller: A gentleman wants to know about the prune.

Mr. Willard: The Fellemborg is the best prune in point of quality, and out of which we can make more money than any other prune, unless it be some of those German prunes.

Mr. Miller: What is the difference between a plum and a prune?

Mr. Willard: The difference between a pumpkin and a squash.
[Laughter.]

The Secretary: I know we have all been interested in the remarks of Professor Taylor, Mr. Vandeman and Mr. Willard, and I therefore move that they be made honorary members of our Society.

The motion was unanimously carried.

The President: We have had a pretty good feast. A good many have to leave shortly, therefore isn't it a good time to wind up the

thirtieth annual meeting of the Ohio Horticultural Society? If you think so, we will have the final resolutions and bring our meeting to an end.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That we tender our most hearty thanks to the Athens County Society and the citizens of Athens, for their kind hospitality; to the Hon. Chas. Grosvenor, for the most cordial welcome extended to us; to the ladies of Athens, especially, for their kind interest manifested in so beautifully decorating the hall; to Miss Castle, Miss Ryan and Mr. Clayton, for the delightful solos with which they favored us; to Mrs. Helen Burns, for the most excellent paper presented on Wednesday evening; to Professor Wheaton and the High School Chorus, for the delightful entertainment of Thursday evening; also to our genial host of Hotel Berry, who has personally contributed so largely to our comfort and pleasure; and to all who have in any way helped to make this, our thirtieth annual session, one of the most interesting and profitable in our history.

L. B. PIERCE,
MRS. K. A. ARTHUR,
JAMES S. HINE,
Committee.

On motion of Mr. Rockhill, the report was adopted. And thereupon the Convention adjourned *sine die*.

VARIETIES OF FRUIT FOR COLD STORAGE.

By R. A. HUNT, of Euclid, O.

[Read at district meeting at Painesville, O., February 16, 1897.]

To commence at the beginning of this subject, I will say that a great many people have formed erroneous ideas in regard to cold storage. I will mention a couple of instances that came under my observation, during the first years of my experience in the storage business.

The managers of an institution, not many miles from the city, had a chance to buy about 1,500 pounds of butter, that was a little off. (An expression used by the trade.) They came to make arrangements to have it kept in storage until they could use it. I was ignorant in regard to the condition of the butter, till the drayman came with it. Said I to the drayman: "I don't want to take that butter in and charge them for storage; it is spoiled, and they will think it ought to come out all right and good." Then the drayman spoke his little piece. It would not sound well to repeat all he said. I think what brought it out, was that he boarded at the institution, and had tried to eat some of the same article. He said that he asked them what they would do with so much of that stuff. You are to take it to the cold storage. It will keep there all right, and that smell will disappear. Ladies and gentlemen, it never did disappear, until butter tubs and all vanished from sight. Cold storage kept it just as strong as it was when it went in, and if I can say any thing in its favor, it is this: its strength increased with its age.

My experience with one of the first loads of apples that came to the storage was similar, in some respects, to the butter. The man honestly believed that cold storage was for the purpose of keeping unsound fruit.

What does cold storage mean? It means a room or building so arranged that with the use of ice, or chemicals, the atmosphere in the storage room can be kept

at a uniform degree of temperature, whether the temperature outside is 90 degrees in the shade, or twenty degrees below zero.

To begin with the list of fruit that is usually put in storage, I will take the strawberry first, as it comes first in the season, and is looked upon as the queen of small fruits. If they are carefully picked, with the stem attached, and not over ripe, they will keep nicely about one week, and if the weather is very warm, they will have to be used in from four to six hours after they are removed from storage.

A great deal depends on the condition of the atmosphere outside, at the time of removal of any fruit from cold storage. When fruit is moved from a cold to a warm atmosphere, in a few minutes its surface will be covered with moisture. That is the cause of storage fruit spoiling so quickly after removal. If the same fruit should be removed on a cool day, or gradually brought into a warmer atmosphere, so that there would not be so great a change, then the fruit would stand up as long as it would, if taken from a common cellar. Frozen apples or raspberries can be kept only a few days longer than strawberries. Cherries from one to three weeks, according to the variety. Plums from two to four weeks. The Italian prune is one of the best keepers. Peaches, the early varieties, from one to two weeks. Late varieties, like Smock and Salway, four to six weeks. I have kept them longer, but they lose that peach flavor, the very thing that we are after when we eat one.

Pears are better adapted for cold storage than any other fruit, except the king of fruits, the apple. One of the first pears to ripen is the Mary, and it is one of the very few varieties that is better to ripen on the tree. It has no place in storage. The Tyson handles well in storage, but must be removed before the Bartlett makes its appearance. It is better to hasten its ripening than to retard it. Clap's Favorite is a fine pear, but has to be handled rapidly. Bartlett stands in the front rank as a storage pear. It can be kept successfully from four to six weeks. There are more bushels of this variety kept in storage than all other varieties combined. Flemish Beauty will hold in good shape about two weeks longer than Bartletts. Seckel one or two weeks longer than Flemish. Clargo requires a warm room, as it soon turns black if exposed any length of time to a cold atmosphere. Howell and Doyenne are two splendid pears for storage; they never scald. Duchess and Anjou come in order to lengthen the season; both varieties are excellent for retarding. The longest keepers that I have had any experience with in storage are Winter Nellis and Lawrence. I give the Lawrence first place. I had nearly forgotten the beautiful Kieffer, while I was thinking about the other luscious pears.

I love to see beautiful fruit; but I must confess that which pleases the palate comes into my mind and mouth first. I can see no good qualities in the Keiffer for storage, although I have handled them in a limited way ever since they have been on the market.

The varieties of grapes that I have handled in storage are the following: Worden, Brighton, Delaware, Montefierra, Salem, Wilder, Vergennes, Martha, Niagara, Lady Washington, Diana, Concord, Catawba, Iona, and a good many other varieties that would be useless to mention, as they had no particular merit, and not raised plentifully enough to be known on the market. The only varieties that I have found to be good keepers and saleable after they have been kept beyond the usual period of ripening, are the Concord, and I find they give the best results if closed out by Thanksgiving. The Wilder is the best keeper of any black grape that I am acquainted with, but not many are grown. Of white grapes, Niagara and Lady Washington, not later than Christmas. Delaware will keep well for about two months, but the demand is limited. Catawba is recognized as the leader for storage and market. They can be kept during all the winter months. The Vergennes is also a good keeper, and the demand is on the increase.

Apples for storage comprise a long list. I will mention some of the leading varieties that I have had experience with. I will skip the class of pippins, as most

of them are fall varieties, and if there is a crop of winter fruit the summer and early fall varieties find a poor market if kept beyond their season. The Snow or Famuese, grown in some sections of York State and Canada, always find a place in storage. They are hardly ever kept longer than three months. The Belmont or Gate apple, in sections where known, is much sought after by storage men. Will keep without much loss from four to five months. The King, not as good keeper as Belmont, unless grown farther north. Grimes' Golden, a good keeper up to about March. The Greening, which used to keep so nicely in the common cellar, scalds badly if kept too long in storage. Northern Spy and Wagner are good varieties if well-colored. Baldwin has its name stamped on more barrels in the storage room than any other three varieties. The Hubbardston is a better keeper than the Baldwin, and the Spitzenburg is still better. Canada Red has no superior as a keeper among the good dessert varieties. Rome Beauty, Ben Davis, Cooper's Market, three varieties, although in quality are inferior to the Baldwin, are longer keepers. Some of the varieties of Russetts can be held over for the next season without much loss. The Winkler, an apple brought to this section by Mr. M. E. Sweet, proves to be an extra variety for retarding. I would like to see more of them grown in this section, as I think they will prove to be a profitable variety. You ask about the Little Lady. She is all right in her place. Though in size the least, she brings the highest price at the Christmas feast.

List of Members

OF THE

Ohio State Horticultural Society.

A

Names.	Town.	County.
Albaugh, N. H.....	Tadmor.....	Miami.
Aldrich, O. W.....	Columbus.....	Franklin.
Ames, L.....	Weston.....	Wood.
Aultfather, H. H.....	Minerva.....	Stark.
Allen, C. W.....	Erie, Michigan.....	Monroe.
Ayers, J. C.....	Eldorado.....	Preble.
Arthur, Mrs. K. A.....	Zanesville.....	Muskingum.
Atwater, J.....	Castalia.....	Erie.
Almack, J. W.....	Coshocton.....	Coshocton.
Alderman, W. N.....	Athens.....	Athens.
Avery, C. L.....	Euclid.....	Cuyahoga.

B

Bitzer, M.....	N. Berlin.....	Stark.
Buechley, E. M.....	Greenville.....	Darke.
Beaver, John F.....	Dayton.....	Montgomery.
Britton, J. H.....	Painesville.....	Lake.
Broadhead, E. A.....	Kittaning, Pa.....	Armstrong.
Brownley, E. H.....	Amesville.....	Athens.
Baker, C. V.....	Stoutsville.....	Fairfield.
Benton, H.....	Savannah.....	Ashland.
Bredbeck, Wm.....	Danbury.....	Ottawa.
Brown, Frank I.....	Columbus.....	Franklin.
Berry, P. D.....	Dayton.....	Montgomery.
Banta, C. W.....	Lima.....	Allen.
Bates, C. C.....	Cuba.....	Clinton.
Beal, J. A.....	Troy.....	Miami.
Bear, J. C.....	Dayton.....	Montgomery.
Barlow, A. & Son.....	Barnesville.....	Belmont.
Burtsfield, J. A.....	Pattersonville.....	Carroll.
Barclay, J. E.....	Neapolis.....	Lucas.
Bobo, Wm.....	Leysander.....	Athens.
Bethel, A. S.....	Athens.....	Athens.

C

Names.	Town.	County.
Campbell, G. W.....	Delaware.....	Delaware.
Crawford, M.....	Cuyahoga Falls.....	Summit.
Cushman, E. H.....	Euclid.....	Cuyahoga.
Cox, Nelson.....	Bradrick.....	Lawrence.
Claypole, E. W.....	Akron.....	Summit.
Church, Royal.....	Wolpin.....	Meigs.
Clotts, Frank.....	Gahanna.....	Franklin.
Cook, J. A.....	Augusta.....	Carroll.
Codding, A. J.....	Augusta, Illinois.....	
Cope, E.....	Rogers.....	Columbiana.
Cox, E. G.....	Bradrick.....	Lawrence.
Carey, W. R.....	South Kirtland.....	Lake.
Curry, F. M.....	Minerva.....	Stark.
Campbell, G. K.....	Coolville.....	Athens.
Courtwright, Silas.....	Lancaster.....	Fairfield.
Canton, George.....	Zanesville.....	Muskingum.
Cowen Bros.....	Barnesville.....	Belmont.

D

Dillie, W. H.....	Euclid.....	Cuyahoga.
Dietz, Theo.....	Zanesville.....	Muskingum.
Deming Co.....	Salem.....	Columbiana.

E

Eaton, L. D.....	Labelle.....	Lawrence.
Evill, F. B.....	Kirtland.....	Lake.
Elliott, Albert.....	Defiance.....	Defiance.
Eaton, J. P.....	Labelle.....	Lawrence.

F

Freeman, Isaac.....	Rex.....	Miami.
Farnsworth, W. W.....	Waterville.....	Lucas.
Fulweiler, George.....	Dayton.....	Montgomery.
Ford, Frank.....	Ravenna.....	Portage.
Faust, F. N.....	Canton.....	Stark.
Flory, J. A.....	Wengerlawn.....	Montgomery.
Foote, J. L.....	Brooklyn.....	Cuyahoga.
Frease, E. F.....	Okolona.....	Henry.

G

Green, W. J.....	Wooster.....	Wayne.
Geib, Peter.....	Cleveland.....	Cuyahoga.
Gilbert, H. W.....	Palmyra.....	Portage.
Gatton, Cyrus M.....	Belleville.....	Richland.
Gault, W. G.....	Ruggles.....	Ashland.
Gill, G. W.....	Columbus.....	Franklin.
Gates, F.....	Painesville.....	Lake.
Green, J. G.....	Sandusky.....	Sandusky.

H

Names.	Town.	County.
Harrison, J. J.....	Painesville	Lake.
High, George M.....	Middle Bass	Ottawa.
Hunt, R. A	Euclid.....	Cuyahoga.
Harris, C. W.....	Toledo.....	Lucas.
Harrington, C.....	Painesville	Lake.
Hale, Albert	Mogadore.....	Summit.
Hartzler, J. P.....	Weilersville	Wayne.
Hale, Clayton.....	N. Berlin.....	Stark.
Hine, J. S.....	Columbus	Franklin.
Hicks, Wilber W	Toledo	Lucas.
Hollibaugh, H. A.....	Marlborough	Stark.
Hathaway, A. F.....	Cleveland (Sub Station 1).....	Cuyahoga.
Harvey, R. R	Carrollton.....	Carroll.
Harold, A. W.....	Columbiana	Columbiana.
Hay, John.....	Canton.....	Stark.
Hartzler, D.....	Gettysburg	Darke.
Hart, Isaac	Covington	Miami.
Hoover, Daniel.....	New Berlin.....	Stark.
Holt, J. B.....	Rutland.....	Meigs.
Hull, F. W. & Sons.....	Lane	Lake.
Halladay, J. R.....	North Star.....	Darke.

I

Innis, G. S.....	Columbus	Franklin.
Inlay, J. D.....	Zanesville..	Muskingum.

J

Jenkins, J... ..	Winona.....	Columbiana.
Jenkins, E. W.....	New Lebanon.,.....	Montgomery.
James, J. A.....	Washington Court House.....	Fayette.

K

Knowlton, Levi.....	Utica.....	Licking.
Kramer, Wm.....	Dayton.....	Montgomery.
Kime, Geo. T.....	Zanesville	Muskingum.
Krider, C. A.....	Massillon.....	Stark.
Knellinger, Frank	Zanesville	Muskingum.
Kelck, W. S.....	Dayton.....	Montgomery.

L

Lauppa, Chas.....	Urbana.....	Champaign.
Longenecker, Theo.....	Dayton.....	Montgomery.
Lentz, D. H.....	Piqua.....	Miami.
Livingston, A. W	Columbus	Franklin.
Leonard, A. M.....	Piqua	Miami.
Lefever, W. G.....	Mt. Gilead.....	Morrow
Lawrence, G. W	Canton.....	Stark.
Loop, A. J.....	North East, Pennsylvania.....	
Long, F P.....	Okolona.....	Henry.
Lowry, D. G.....	Canton.....	Stark.

Names.	Town.	County.
Lawrence, J. A.....	Harlem Springs.....	Carroll.
Longenecker, L.....	East Lewiston.....	Mahoning.
Long, M.....	Mapleton.....	Stark.
Lawrence, G. E.....	Marion.....	Marion.
Lloyd, J. J.....	Grelton.....	Henry.

M

Miller, W.....	Gypsum.....	Ottawa.
Moore, N. & Son.....	Toledo.....	Lucas.
Moore, S. R.....	Zanesville.....	Muskingum.
Maxwell, J. W.....	Euclid.....	Cuyahoga.
Moore, R.....	Piqua.....	Miami.
Miller, H.....	Hageman.....	Darke.
Montgomery, Cary W.....	Newark.....	Licking.
McDowell, J. K.....	Massillon.....	Stark.
Mayers, S. C.....	North Vernon, Indiana.....	
Mumma, A. W.....	Dayton.....	Montgomery.
Mardis, J. F.....	Lebanon.....	Warren.
McKee, John T. & Son.....	New Carlisle.....	Clark.
Miller, Wm. W. (Hon. Member)....	Columbus.....	Franklin.
Miller, J. A.....	Osborn.....	Greene.
Morrow, J. C.....	Paulding.....	Paulding.
Moorehead, S. E.....	Minerva.....	Stark.
Moore, U. S.....	Mohawk Village.....	

N

Niess, J. F.....	Canton.....	Stark.
Niess, J. K.....	Maumee.....	Lucas.

O

Ohmer, N.....	Dayton.....	Montgomery.
Overholser, D.....	Alpha.....	Greene.

P

Pentland, F.....	Lockland.....	Hamilton.
Pierce, L. B.....	Tallmadge.....	Summit.
Pfrimmer, J.....	Milford.....	Clermont.
Powell, S. A.....	Givens.....	Pike.
Philpott, S. A.....	McClure.....	Henry.
Peterstein, J. W.....	Webster.....	Darke.
Perkins, W. E.....	284 W. Pleasant St., Springfield...	Clark.
Palmer, P. J.....	McDonaldsville.....	Stark.
Perrine, J.....	Lebanon.....	Warren.
Patterson, W. H.....	Melrose.....	Paulding.
Phillips, Thos.....	Shade.....	

R

Roth, J. F.....	Canton.....	Stark.
Ragan, W. C. (Hon. Life Mem.) ...	Greencastle, Indiana.....	
Roudebush, Lowell.....	Stonelick.....	Clermont.
Rockhill, S. H.....	Canton.....	Stark.
Ritter, F. W.....	Dayton.....	Montgomery.
Reeves, Mrs. J. E.....	Loveland.....	Clermont.
Rutherford, M. O.....	Langsville.....	Meigs.

S

Names.	Town.	County
Streeper, J. P.....	Columbus.....	Franklin.
Shinkle, G. W.....	Hamersville.....	Brown.
Stoppelman, J. H.....	Dayton.....	Montgomery.
Shirer, Alfred.....	Dayton.....	Montgomery.
Sweet, M. E.....	Kirtland.....	Lake.
Suter, Peter.....	Waterville.....	Lucas.
Sterling, C. C.....	Grand Rapids.....	Wood.
Sweetland, C. B.....	Zanesville.....	Montgomery.
Selby, August D.....	Wooster.....	Wayne.
Scarff, W. N.....	New Carlisle.....	Clark.
Slade, H. D.....	East Cleveland.....	Cuyahoga.
Sala, Bros.....	Minerva.....	Stark.
Stoner, E. F.....	Little York.....	Montgomery
South, A. G.....	Owensville.....	Clermont.
Sanderson, N.....	Kaums.....	Cuyahoga.
Snyder, J. J.....	Paris.....	Stark.
Storrs, W. G.....	Painesville.....	Lake.
Scarff, B. B.....	Tippecanoe City.....	Miami.
Smith, Wm. H.....	134 Garfield St., Dayton.....	Montgomery.
Swigart, H.....	Dean.....	Montgomery.
Shelby, S. P.....	Toledo.....	Lucas.
Schramm, Chas.....	Athalia.....	Lawrence.
Swartzwalder, M.....	Pomeroy.....	Meigs.
Swart, S. W.....	Willoughby.....	Lake.

T

Tyron, J. H.....	Willoughby.....	Lake.
Tracy, W. N.....	Toledo.....	Lucas.
Tussing, R. J.....	Canal Winchester.....	Franklin.
Taylor, Sam'l.....	Pleasant Corners.....	Franklin.
Thornsburg, Thos.....	Ashland.....	Ashland.
Towers, Thos.....	Toledo.....	Lucas.
Thompson, Wm.....	New Carlisle.....	Clark.
Tioll, J.....	Brooklyn.....	Cuyahoga.
Teeter, D. M.....	Belleville.....	Richland.

V

Van Deman, H. A. (H'n. Life Mem.).....	Washington, D. C.....	
--	-----------------------	--

W

Withoft, Fred G.....	Dayton.....	Montgomery.
Waid, C. H.....	Emery.....	Fulton.
Woodard, E. M.....	Kirtland.....	Lake.
Whitney, C. L.....	Warren.....	Trumbull.
Williams, Alex.....	South Kirtland.....	Lake.
Warner, E. M.....	East Toledo.....	Lucas.
Webster, F. M.....	Wooster.....	Wayne.
Wood, J. H.....	Madison.....	Lake.
Warder, R. H.....	North Bend.....	Hamilton.
Woodward, D. K.....	Lordstown.....	Trumbull.

Names.	Town.	County.
Wheeler, W. A.....	Perry.....	Lake.
Withoft, J. M.....	Dayton.....	Montgomery.
Wickoff, F.....	1910 E. Madison St., Baltimore, Md.	
Wheeler, W. J.....	Melrose.....	Paulding.
Williams, A. E.....	South Kirtland.....	Lake.
Walker, H.....	Minerva.....	Stark.
Whitacre, F. L.....	East Rochester.....	Columbiana.
Watts, Geo. T.....	Geneva.....	Ashtabula.
Wise, Watson.....	Canton.....	Stark.

Y

Young, Henry.....	Ada.....	Hardin.
Yeslin, C. F.....	Toledo.....	Lucas.

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